Forestry

VETERINARY MEDICINE

NOV 21 1930

December, 1930

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No. 12
VOL. XXV

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Veterinary Medicine

VOL. XXV DECEMBER, 1930 No. 12

Published Monthly by the Veterinary Magazine Corporation
75 East Wacker Drive, Chicago, Ill., U. S. A.
$4.00 a Year

Entered as second-class matter Nov. 8, 1920, at the post office at Chicago, Ill., under the Act of Mar. 3, 1879.
Entered as second-class matter under the title of American Journal of Veterinary Medicine, July 19, 1910, at Chicago, Illinois, under Act of March 3, 1879.

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D. M. Campbell, Editor A. T. Kinsley, Associate Editor

The venom of the honey bee, according to Mayo Foundation investigators, resembles crotalarin (venom of the rattlesnake). The honey bee venom is marked hemolytic and is an endothelial poison.

Dairy products are the source of about 16% of the total gross income of farmers in the United States. In the five-year period 1924-1928 farmers received from the sale of milk about 2½ billion dollars. This was greater than the income from hogs, from cotton, from poultry products, cattle, or any other farm products.

The *B. suipestifer* is apparently capable of doing a variety of things. Thus it is credited with being the primary cause of an enteric disorder, a fatal septicemia, and an occasional pneumonic condition in swine; food-poisoning in the human and recently a case of septicemia in a human was attributed to the *B. suipestifer*.

In the United States dourine was first recognized by W. L. Williams in Illinois in 1886. Later, the disease occurred in Nebraska, Iowa, North and South Dakota, Wyoming, New Mexico, Arizona. In 1929 the disease was identified only in Nevada and Arizona. By persistent efforts the Federal B. A. I. has practically eradicated the disease, excepting on one or two Indian reservations in Nevada and Arizona, where progress in eradication is being made.

Before the advent of the antivenom serum there was a high percentage of fatality of humans that were bitten by rattlesnakes, the death toll in Brazil was about 5,000 annually.

According to Huddleston and Johnson, the rash or erythema that occurs on the skin of the arms of some veterinarians after vaginal and uterine examination of cows is an indication of a hypersensitiveness to the *B. abortus*. This rash may occur within 15 or 20 minutes and may persist for several days.

November 6, 1930, was the 50th anniversary of the discovery of the plasmodia that causes malarial fever, by Alphonse Laveran, an army surgeon in Algiers. A few years later, Sir Arnold Ross, then of the Indian Medical Service, proved that the transmission of malaria parasite from man to man is dependent on certain species of mosquitos and in 1897 Sir Arnold demonstrated the malaria plasmodium in the stomach wall of an Anapholes mosquito. It is 300 years since quinin (cinchona bark) was first used in the treatment of malaria, and it still constitutes the only specific remedy for the disease, in fact one of the very few (except for certain biologic products) specifics in medicine. Preventive measures against malaria were made possible by the discoveries of Laveran and Ross; particularly of the latter.

The United States, Denmark and the Netherlands in the order named, are the principal pork and pork products exporting countries of the world. The United States' Pork exports equal those of all other countries. Denmark's pork exports exceed the combined pork exports of all other countries except the United States.

Denmark has two and one-third as many hogs in proportion to its population as has the United States. The swine population of Denmark is slightly greater than the human population. In the United States, the number of swine is less than half the number of people. Denmark has 300 hogs per square mile of territory, continental United States has 18.

Great Britain (exclusive of the Irish Free State), Germany and France in the order mentioned, are the principal pork and lard importing countries. Great Britain imports more than four times as much of these products as both the other countries. Great Britain's swine population is less than one-twelfth that of its human population.

Bacon exports from Denmark to Great Britain have nearly doubled since 1925. Exports of bacon from the United States to Great Britain in the same period have declined 60%. Danish hog production is 80% above prewar levels; United States 40% above, and Germany approximately the same as before the war.

In order to make good gains on the fall pigs to bring them through the winter months in a thrifty condition, they need to be given a good start. Strong, vigorous young pigs are well on their way towards making profits for their owners next spring. They should not be weaned until 8 or 10 weeks of age. Also, if they are trained to eat grain in a creep away from the sow, they will lose little flesh at weaning time. Keep the beds dry and provide well-ventilated quarters free from drafts. Dry feeding is better in winter than slop.—*Successful Farming.*

An occasional death in the horse has been reported as a result of injury due to stinging by large numbers of bees. In most such instances, death succeeded extreme exhaustion due to running and have been presumed to be due to heat stroke.

One cannot deny the relationship of the casual agents of white diarrhea and fowl typhoid and the resemblance between the diseases for which they are responsible, but it has seemed preferable to continue to distinguish between the two diseases. Bacillary white diarrhea and fowl typhoid are only a special case of the typhoid-colon group, in which the distinction are never well marked . . . . Vaccination against fowl typhoid in spite of its imperfections and its failures, even carried out with stock vaccines, is, in the majority of cases, an effective weapon in the struggle against the disease.—Pauissett, France, at the Inter. Vet. Cong.

Sweet clover pasture for cattle and sheep is economical, at least in some locations. It has been demonstrated that each acre of sweet clover pasture in Northwest Minnesota is equal to two acres of any other pasture that can be provided.

The objectional features of sweet clover pasture are: First, animals will not eat it readily until they become accustomed to it; second, there is considerable danger of bloat; and third, there is danger of so-called sweet clover poisoning, or sweet clover disease.

In view of the many points of resemblance between fowl typhoid and bacillary white diarrhea, it is open to question whether these diseases should be discussed separately. The evidence which has accumulated in recent years suggests that Klein's bacillus, *B. sanguinarium,* is a variant of *B. pullorum,* which is gradually acquiring the characters and powers of the parent organism. It is submitted that this suggestion should be accepted and that fowl typhoid and bacillary white diarrhea should be regarded as merely different forms of the same disease. No sharp line of demarcation between them now seems tenable.—Rice, Belfast, at the Inter. Vet. Cong.

It looks now that the brood sows kept this fall ought to raise us a profitable crop of pigs next spring.—*Successful Farming.*

If I were a hog raiser I would plan to breed as many sows as possible next year.—H. M. Conway, in *Successful Farming.*

The Iowa State College recommends 0.43 square inches of ventilation flue for each bird in the poultry house.—*Successful Farming.*

German police dogs may have a place somewhere but it is certainly not in roaming loose over the country. I believe they are responsible for more damage to stock than all other breeds of dogs put together. In fact, I would be in favor of a bounty on them as on wolves.—*Successful Farming.*

Seventeen years ago, or during the year of 1913, about 90,000 hogs were trucked to the Indianapolis market. Last year more than one and one-third million hogs, or 63% of all those received in Indianapolis, came in by truck. Total losses for crippled and dead hogs last year amounted to less than 3 cents a hog.—*Successful Farming.*

Recent investigations tend to prove that there is a close relationship of certain poultry diseases to the lack of certain elements in food. A disease so closely resembling contagious roup that it is impossible, except by laboratory tests, to differentiate the two, is clearly shown to be due to lack of vitamin A. This is an essential food element contained in yellow corn, milk, leafy vegetables, and codliver oil.—Charles Murray, in *Successful Farming.*

Brucella abortus has been isolated 78 times from the stools of six human patients and once from bile procured by duodenal drainage. This organism was also isolated from the contents of the gall bladder. Thus it is evident that these microbes may pass through the digestive tract of man and may be a factor in disturbances of the gall bladder.—*Jour. A. M. A.*

Nebraska farmers who have kept a record of the cost of operating their tractors find that a two-row general purpose tractor costs 88 cents per hour to operate.—*Successful Farming.*

Overcrowding must be avoided if the flock is to escape the disease hazard. There is nothing more conducive to an outbreak of disease than overcrowding and the accompanying lack of cleanliness that is inevitable. —Charles Murray, in *Successful Farming.*

Crotalin, the active principle of the venom of the rattlesnake, reduces blood pressure and has a pronounced cytolytic action. Thus damaging nerve cells and destroying red blood corpuscles. The injury to the blood corpuscles accounts for the apparent hemorrhage into the tissues.

One on the infectious diseases of poultry likely to occur in winter is fowl pox. Like smallpox in man, this disease occurs only after exposure to an active case or to the discharges from a case. Therefore, its prevention depends wholly upon preventing contact of the flock with infected birds or infective material.—Charles Murray, in *Successful Farming.*

Weight is almost an absolute limiting factor in the capacity of horses to pull and to endure sustained effort. The world's best pair of pullers belong to George Wilcox, a farmer of Greenville, Ohio, and weighed 3,790 pounds at the time of their 3550-pound tractive pull, which won the World's Championship.—Wayne Dinsmore.

Cattle ticks that harbor and transmit the piroplasm of tick fever were responsible for the quarantine of 983 counties with a total area of 728,565 square miles in 15 different states in 1906. January 1, 1930, the quarantined area had been reduced to 184 counties with a total area of 151,198 square miles in 5 different states. Thus, nearly 600,000 square miles have been ridden of this expensive parasite through the activity of veterinarians.—*Science,* 72 No. 1864.

VETERINARY COLLEGES' ENROLLMENT SHOWS INCREASE

The enrollment for the school year 1930-31 at eleven recognized veterinary schools in the United States and one in Canada shows an increase over the enrollment for 1929-30. The increase on the whole is not large, but is nevertheless material. Only one of the twelve schools, Washington State, shows a decrease in the total enrollment.

In all the schools, the gain in the first year classes is 63, and in the total enrollment is 133. Excluding special and graduate students the gain is 135 or nearly 13%. Last year the gain over preceding year was 130

Name of College	1921-1922						1922-1923						1923-1924						1924-1925						1925-1926					
	First Year	Second Year	Third Year	Fourth Year	Special	Total	First Year	Second Year	Third Year	Fourth Year	Special	Total	First Year	Second Year	Third Year	Fourth Year	Special	Total	First Year	Second Year	Third Year	Fourth Year	Special	Total	First Year	Second Year	Third Year	Fourth Year	Special	Total
Alabama	10	5	14	12		41	6	5	8	13		32	3	2	4	7		16	6	3	6	6	1	22	4	4	3	5		16
Colorado	23	13	19	16	1	72	17	14	12	19	2	64	10	15	12	13	1	51	6	5	14	11		36	10	10	15	12	1	48
Georgia	9	5	5	2		21	7	7	6	5		25	2	8	7	5		22	7	2	7	7		23	3	6	2	6		17
Iowa	28	17	18	19	6	88	25	22	15	17		79	32	24	18	16		90	27	27	17	17	1	89	35	14	26	15		90
Kansas	12	10	23	10	4	59	10	14	18	22	1	65	11	10	16	16		53	20	8	11	16	5	60	21	14	10	11	2	58
Michigan	11	5	6	6	1	29	13	10	9	7		39	5	10	11	8		34	11	7	10	10	2	40	4	7	6	11	4	32
New York	15	13	29	16	4	77	31	11	16	31	3	92	29	25	10	19	3	86	19	26	21	10	5	81	24	18	26	20	2	90
Ohio	14	13	24	35		86	19	12	15	25	4	75	13	12	22	20	5	72	7	7	23	30	2	69	17	9	7	21	1	55
Ontario	13	23	35	19		90	17	11	22	37		87	16	13	15	27		71	23	16	15	15		69	20	23	14	12	1	70
Pennsylvania	11	5	8	7		31	11	11	5	8	2	37	14	10	10	5	2	41	25	10	10	10	1	56	15	23	9	10	1	58
Texas	5	1	2	4		12	6	6	2	2		16	11	4	5	2		22	3	6	5	6		20	0	1	4	5		10
Washington	7	2	7	6		22	6	5	4	4		19	8	8	4	6		26	10	6	8	3		27	13	12	5	8	1	39
	163	113	192	154	16	638	168	128	132	190	12	630	154	141	134	144	11	534	164	123	147	141	17	592	166	141	127	136	13	583

Name of College	1926-1927						1927-1928						1928-1929						1929-1930						1930-1931					
	First Year	Second Year	Third Year	Fourth Year	Special	Total	First Year	Second Year	Third Year	Fourth Year	Special	Total	First Year	Second Year	Third Year	Fourth Year	Special	Total	First Year	Second Year	Third Year	Fourth Year	Graduate	Special	Total	First Year	Second Year	Third Year	Fourth Year	Graduate	Special	Total
Alabama	4	4	4	3	2	17	4	4	4	4	2	18	9	2	11	4		26	9	10	2	10		3	34	20	8	10	4			42
Colorado	20	5	11	11	2	49	16	19	7	9	3	54	31	21	15	5		72	37	26	23	12			98	29	29	29	15		1	103
Georgia	4	1	5	2	1	13	6	4	1	5		16	20	9	3	2		34	13	16	9	2			40	13	12	14	8			47
Iowa	37	25	17	26	4	109	39	32	22	16	4	113	55	37	30	20	6	148	62	55	38	29	3	2	189	92	53	42	40	6		233
Kansas	18	17	19	5	5	64	18	19	14	18	5	74	30	17	16	16	4	83	56	26	15	17		4	118	41	43	21	15	2	4	126
Michigan	11	5	1	11	3	31	6	7	10	4	7	34	5	4	8	12	6	35	8	10	7	9	8		42	14	8	11	8	6	5	52
New York	30	22	17	27	7	103	39	28	22	18	7	114	47	36	23	28	4	138	32	40	33	23		9	137	58	28	40	34	3		163
Ohio	25	10	12	8	4	59	49	19	15	13		96	34	37	22	15		108	37	28	33	24	4		126	48	28	36	31	6		149
Ontario	15	21	21	10	1	68	23	15	21	19	1	79	22	19	18	18	2	79	21	25	19	16			81	36	21	23	19			99
Pennsylvania	15	15	23	9	3	65	21	17	9	22	3	72	34	21	18	9	6	88	42	26	21	18			107	40	27	25	19	1	1	113
Texas	1	3	3	3		10	3	1	3	2		9	7	5	2	3	1	18	7	7	5	1			20	7	5	7	6			25
Washington	14	17	7	4		42	21	21	18	8		68	28	19	19	20		86	20	24	20	21			85	17	13	24	16			70
	194	145	140	119	32	630	245	186	146	138	32	747	322	227	185	152	29	915	352	295	225	184	15	18	1089	415	275	282	215	24	11	1222

Student Population of American Veterinary Colleges for the Past Ten Years
Compiled from Deans' Reports by O. V. Brumley, Columbus, Ohio

ANESTHETICS—HISTORICAL

Crawford W. Long, a graduate of the Medical Department of the University of Pennsylvania, and practicing at Athens, Georgia, was the first to use ether or any inhalation anesthetic for the relief of pain in a surgical operation. In 1842, he performed his first operation under anesthesia, charging 25 cents for the anesthetic and $2.00 for the operation.

Long did not publish his results and two years later, Horace Wells, a dentist of Hartford, Connecticut, discovered the anesthetic property of nitrous oxid. He attempted a public demonstration of its use which failed, following which he gradually lost his mind and committed suicide four years later.

W. T. G. Morton, a graduate dentist and at that time a sophomore medical student at Harvard University in 1846 gave a successful demonstration of ether anesthesia before his professors and classmates.

Since the introduction of ether and nitrous oxid there have been a number of other inhalation anesthetics discovered; only three of these are in common use—chloroform, ethyl chlorid and ethelene.

Cocain, the first local anesthetic was discovered in Germany by Doctor Koller in 1884, 42 years after Long first used ether. There is now a long list of local anesthetics, the two most commonly employed being novocain (tutocain) and quinin and urea hydrochlorid.—*Hygeia.*

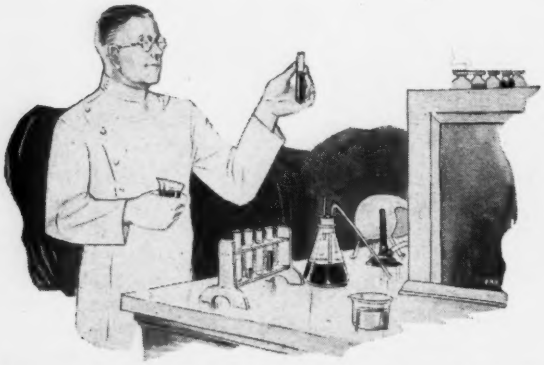
Since the discovery of ether, several other inhalation anesthetics have been introduced, but only three, chloroform, ethyl chlorid and ethylene, have attained and held popularity.

The *Bacillus psittacosis* (*Nocard*) was not found in experimentally infected parrots and parrakeets, in material obtained from human cases, or in infected birds and carcasses shipped to the National Health Institute in the 1929-30 outbreak of psittacosis in the United States.

Two experiments carried out at the Institute indicate that the causative agent of psittacosis in birds is a filterable virus. Equal numbers of birds were inoculated with a filtered and an unfiltered emulsion from non-infective material. The disease was conveyed as readily by the filtrate as by the unfiltered emulsion. Certain of the affected birds were given serum from a recovered case (human) and an equal number given a normal human serum. There was no curative effect observable from the use of the serum. The conclusion seems justified that Nocard's bacillus is not the causative factor in psittacosis of either parrots or humans.

FEDERAL AGRICULTURAL APPROPRIATIONS

The appropriation for the U. S. Department of Agriculture for the fiscal year ending June 30, 1931, totaled $175,618,112, a decrease of $34,093,417 from the amount appropriated for the preceding year. The road funds, $90,116,628 constitute the largest item in the appropriation, for a single activity. The total appropriation for the Bureau of Animal Industry is $15,726,935, an increase over 1930 of $620,300. More than 75% of the total appropriation for the Bureau of Animal Industry is for meat inspection ($5,640,000) and tuberculosis eradication ($6,190,000).



Increases in U. S. Dept. of Agriculture appropriations for 1931 for research projects total $1,600,000.

The sum appropriated for the tuberculosis eradication is $171,000 less than for last year, forecasting a lessened activity because of the progress of eradication. Increased appropriations were made for tick eradiction ($34,000), beef studies ($40,000), and poultry research ($55,700). The total amount appropriated for extension work is $10,427,936, a considerable increase. Rather liberal increases are provided for salaries of employes of the Department, both in Washington and in the Field. Appropriations for research projects show an increase of $1,600,000 over the amount appropriated last year for these purposes.

The peak of tuberculosis in swine and cattle came in 1926. Present condemnations of cattle at public abattoirs are about half what they were at the peak and swine materially less than one-half. Condemnations because of hog-cholera are down to about one-third. Condemnations of cattle because of tick fever are about one-tenth as great as 20 years ago. Meat inspection, on the other hand, reveals the seriousness of the parasite situation, and kidney worms, for example, probably do $5,000,000 a year of damage. Inspection has also guided research by the Bureau of Animal Industry, which has enabled the meat industry to make enormous savings by preventing the spoilage of its products.—John R. Mohler.

Hadley, at the Wisconsin Experiment Station, has developed a biologic product, using the brains and spinal cords of foxes in an advanced stage of the disease, that has shown promising results as a preventive and some measure of effectiveness as a treatment for epizootic encephalitis of foxes. The single experiment is regarded as insufficient to warrant drawing definite conclusions.

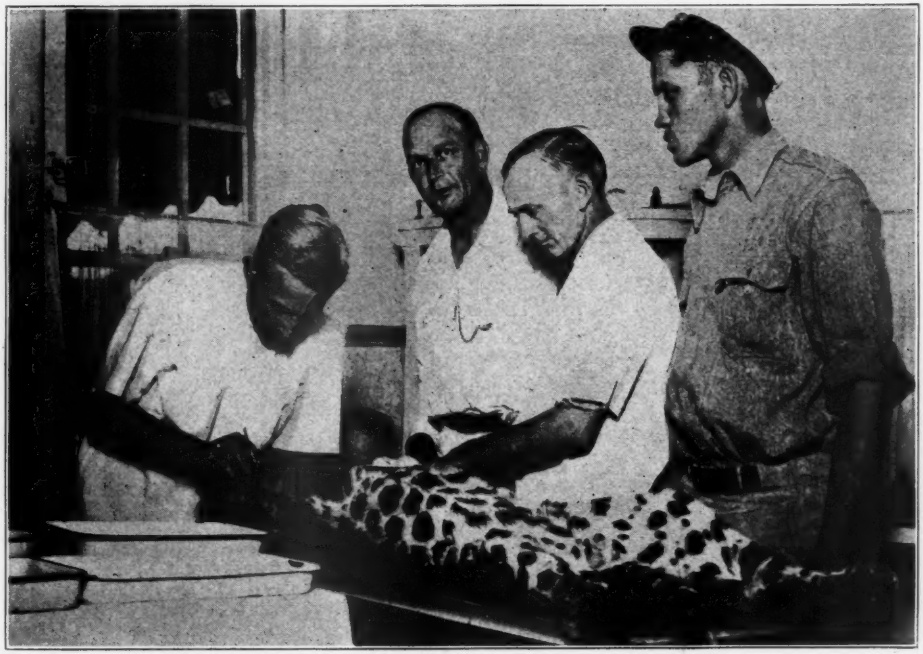
Growing foxes suffer much from a disease characterized by progressive weakness, swollen joints, bowed legs, etc., in short from rickets. Affected fox pups at the Wisconsin Experiment Station showed remarkably rapid improvement when there was added to their ration cod liver oil, lettuce, fresh milk and eggs, all of which contain vitamin D.

An experiment conducted at the Arkansas Experiment Station showed that hens reacting to an agglutination titer as low as 1 to 10, were sometimes carriers of pullorum infection and, inferentially, in accepting only those reacting to a titer of 1 to 25 or higher as is the usual custom, carriers of *S. pullorum* will be left in the flock to perpetuate the disease.

Beach and others at the Wisconsin Experiment Station have developed a pullorin that has given promising results when used as an intradermal test for pullorum disease. This pullorin differs from that heretofore available chiefly in that it is concentrated to one-fourth of the original volume and passed through a berkefeld filter.

This test detected 90% of the affected hens in a flock in which the agglutination test detected only 78%. Unfortunately the pullorin test gave positive reactions in a larger percentage of non-infected hens than did the agglutination test. Further modifications in the method of preparing the pullorin are now under way.

Hadley and Strange at the Wisconsin Experiment Station, showed that intestinal coccidiosis is responsible for a large number of deaths in young rabbits, and a great loss to the rabbit industry in Wisconsin. It was found that the commonest source of coccidiosis is older rabbits which have partially or wholly recovered from the disease and become carriers. Feeding experiments with young rabbits indicated that an excess of green feed is likely to cause digestive disturbances that favor an attack of coccidiosis. Boiling hot water or live steam is the best agent for disinfecting premises, as the eggs of the parasite resist chemical disinfectants in common use.



The illustration shows an operation on a leopard at the Rutherford Veterinary Hospital, Dallas, Texas. The animal was 14 months old and belonged to the Marsalis Park Zoo of Dallas. At the age of six months this leopard was bitten through the flexors by a litter mate. The injury resulted in a contraction of the flexors rendering the leg useless to the animal. The flexor tendons were severed in the usual way and the very firm adhesions broken down. A cast was put on the leg and removed on the tenth day. There was extreme atrophy of the shoulder muscles due to eight months non-usage, but the animal used it comfortably when the cast was removed. The operation was performed by Harry Shepard, assisted by C. Canion. The figures in the illustration from left to right are: Doctor Shepard; Walter Carlton, (head only shows), elephant keeper; Superintendent Blondon, Doctor Canion and George Stevens, keeper of cat animals

ANTHELMINTIC TREATMENT FOR FOALS

In VETERINARY MEDICINE for June 1930 Dr. W. W. Dimock discussed the treatment of parasitisms in horses.

Would it be asking too much to ask for more details of the treatment stating whether the foals are thoroughbred, light or draught horse breed, how many months old?

What is the exact dosage of the ingredients and how contained and what volume of vehicle?

How do you restrain the foal when using the stomach tube? Do they make a fuss? What is external diameter of the tube? What length of tube do you push in? Is the stomach tube introduced through mouth or through the nose?

Do you give carbon disulphid separately from chenopodium oil? If so what vehicle do you use to carry the carbon disulphid through the stomach tube to the stomach?

This treatment of weaning-foals for worms is a procedure which interests me considerably. In my practice it is usually associated with treatment of studs of say 30 to 70 or 80 foals. Of course, to the owner each is valuable and one is not disposed to run any risk, yet our conscience demands an efficient result from the client's confidence.

Sydney, N. S. W. J. R. Stewart.

Reply: Livestock owners and veterinarians are only just beginning to understand and appreciate how very very serious parasitisms are. The economic loss resulting from the injurious effects of animal parasites is much greater per year than the total money spent for the investigation and control of all animal disease problems.

Before coming to Kentucky I spent ten years at the Iowa State College, and during that time had an opportunity to hold post-mortem examinations on a large number of horses. Twenty years ago the breeding of draft horses in the state of Iowa was a major industry. It was known that the majority of horses were heavily infested yet at the time I did not fully realize just how serious parasites in horses were. Since coming to Kentucky I have had an opportunity to go into the problem of parasites in horses more in detail and am just beginning to understand that it is one of our major problems in disease control work. For the past eleven years my work has been largely with the light weight horse; thoroughbred, standard bred, and saddle bred horses, the thoroughbred predominating.

We find that young horses are, as a rule, heavily infested with various forms of intestinal parasites. Many older horses also are heavily infested and therefore play an important part in the perpetuation and spread of the parasites. The problem of dealing with parasites in horses may be conveniently divided into two parts, (1) prevention, and (2) treatment.

Preventive measures include such practices as pasture rotation (yearly intervals) permitting cattle and sheep to run on the pasture. In some cases it might be advisable to cultivate the ground for a year or two and then re-seed to pasture grass. No stable manure from horses should be spread on horse pastures. The exception to this would be manure that had been composted for at least a year in a pit. Loose piles are not wholly effective as the parasites around the edges of the piles will not be destroyed. In case a breeder does not have area enough to practice complete pasture rotation then we believe that much may be done to destroy the parasite eggs and the young larvae by machine mowing pasture and chain harrowing. This seems to be very effective during the hot summer months.

An attempt should be made to provide a fresh pasture for foaling mares and sucklings during the spring and summer months, preferable until weaning time. As the foaling mares normally harbor a considerable number of intestinal parasites they should be treated during the fall. After foaling the mares should be turned out on the fresh pasture. On a few small farms in Kentucky all equine stock (thoroughbreds, work horses, etc.) are treated regularly and systematically for the elimination of parasites every two or three months throughout the year. In all cases where treatment is

not carried out at regular intervals we recommend that all brood mares due to foal in the spring be treated for intestinal parasites twice in the fall or early winter. The first treatment would be not earlier than two or three weeks after the beginning of cold weather or frost sufficiently heavy to destroy the bot fly.

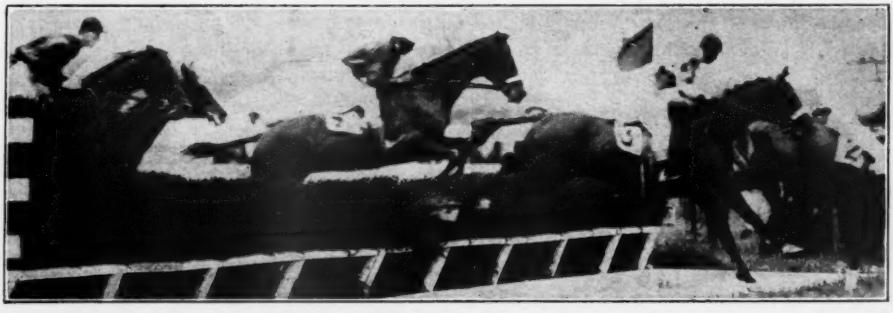
Undoubtedly the most effective treatment for bots and ascarids is carbon disulphid. We have given mature horses one ounce, yearlings one-half ounce, sucklings (2 or 3 months of age) 2 to 2½ drams. For the brood mares the first treatment is carbon disulphid. Following the administration of carbon disulphid, for example during the later part of November or first part of December, a treatment of oil of chenopodium is given. Four to five drams of oil of chenopodium, two ounces spirits of turpentine, one pint each of raw linseed oil and white mineral oil. The above is for the removal of the strongylus vulgaris or blood worm and other numerous closely related species found in the large intestines of horses.

If the brood mares are properly treated during the fall and winter and after foaling are turned out with the foal on a fresh pasture the foals will not immediately become heavily parasitized and under especially favorable conditions might be raised to weaning time without requiring treatment. However, as most brood mares are not treated and mares and foals are turned out on pasture where horses have been kept for years the foals become infested with parasites as an early date. Just how early is shown by the fact that this spring we had occasion to hold a postmortem examination on a three-weeks-old colt, that died from an infection, and found larvae of the *Strongylus vulgaris* or blood worm in the mesenteric arteries. Therefore we are recommending that all sucklings be wormed just as early as possible, two or three months of age, and the treatment continued until the horse goes into training.

In the treatment of sucklings during the spring, summer and early fall or until cold weather, we have used this year carbon tetrachlorid. This is effective against both ascarids and strongyles and to a certain extent removes bots. Sucklings should be wormed at least every sixty days from the time they are two months old until late fall when they are to receive one treatment of carbon disulphid followed some days or weeks later with oil of chenopodium.

The dose of carbon tetrachlorid for colts is to be regulated according to their age, size and general condition. We start out with 4 to 5 drams and gradually increase to one ounce when six months of age. We have given a pony colt between three and four months of age as much as 1 and 1/3 ounces without any apparent ill effect. Yearlings and two-year-olds are given from 1 to 1½ ounces; mature horses, 2 ounces. The dose of carbon disulphid for weanlings five to seven months of age would be 2 to 3 drams, yearlings and two-year-olds, 4 to 6 drams, mature horses one ounce.

The dose of oil of chenopodium for weanlings is 2 to 2½ drams, for yearlings and early two-year-olds 3 to 3½ drams, and for mature horses 4 to 4½ drams. For the weanlings we give with the oil of cheno-



podium one ounce of turpentine and one pint equal parts linseed and mineral oil.

Of course, in any group of horses, sucklings, weanlings, two-year-olds and even mature horses, there will be quite a variation as to their age, size and condition and one should apportion the dose accordingly. Many of our thoroughbred colts at weaning time will vary in age from four to eight months and from 400 to 700 pounds in weight, the majority weighing from 500 to 600 pounds. I received today a report on ten thoroughbred colts just weaned, that have an average weight of 520 pounds. All were weaned at the same time in September and they range in age from four to eight months. In this group a filly foaled in Jan., 1930, weighed 585 pounds, and two colts weighed 565 pounds each, so you see the others were much lighter in weight.

Before treating sucklings we have them separated from the dam for from five to seven hours. As a rule the mare and foal are in the pasture at night. When brought up in the morning they are separated without feed or the colt is muzzled and left in the stall with the mare and is given the worm treatment five to seven hours later. After weaning, and for all older horses, they should be starved out thoroughly. It is customary to take away all hay, give the animal a bran mash, for example in the morning, and then let it go without feed until the next morning, or for twenty-four hours. Water should be available at all times.

I believe, as do many others here in Kentucky, that the most satisfactory way to give worm medicine to horses is by the use of the stomach tube. The stomach tube is *passed through the nose* into the esophagus. The tube should be passed into the esophagus for a distance of at least two feet. It does not necessarily have to reach the stomach. We use a small rubber stomach tube 5/16 inch outside diameter for all colts and young horses, in fact it is quite as satisfactory for mature horses as the larger tube. The tube should be well lubricated with glycerin, passed through the nasal passage on the *floor* of the nasal canal. For very young foals I use a tube that has become soft and flexible from use, for weanlings and up the new stiffer tube is far more satisfactory.

In giving the carbon tetrachlorid and the carbon disulphid one may use a four-ounce metal dose syringe or a funnel. The proper amount of medicinal agent is measured out in a graduate. When giving carbon tetrachlorid we give in addition eight ounces of a solution of glauber's salts 2½ pounds to a gallon of water. With the carbon disulphid we simply give enough water to make sure that the carbon disulphid is completely forced through the stomach tube. In giving the oil mixture we usually use an injection pump, especially for the older horses that are to have one quart of the mixture.

The horses are handled either in the stall or alley way of the barn or even out in the open. As a rule the animal stands better in its own stall; however, in the case of a bad actor there is often not room in the stall to handle the animal without danger of some one being hurt. Most animals, both young and old, will stand and offer little or no resistance if the nose twitch is applied and the animal is held by experienced men. For sucklings and weanlings that are not altogether halter broke a convenient and safe way of securing is to first apply the twitch, stand the animal against a smooth partition, passing the halter rope through a ring or around a bar or post at about the level of the horse's head when standing naturally. The end of the rope is brought down around the lower part of neck or chest of the animal, one man holds the twitch, another holds the halter rope and helps to hold the animal against the partition, a third man places his hand under the tail of the colt holding him firmly close up to the partition. There is no danger of injuring the tail if the hand is pressed against the body instead of lifting up on the tail. Often a colt backed into a corner will stand quietly while the tube is being passed and the medicine administered.

We have never experienced any serious trouble in holding animals for passing the stomach tube. It is possible to handle young horses even though they are not thoroughly halter broke without either danger to the

animal or to the operator. I have had more difficulty in passing the stomach tube on old mares than I have had on younger horses. Occasionally one meets with an old mare that is correctly known as an "outlaw" that refuses to take the stomach tube.

If one plans to use the stomach tube for administering medicine to animals the first essential requirement is to learn to tell when the tube is in the esophagus. In young, thin-necked horses one can see the tube from the outside as it passes down the esophagus. In heavily fleshed, thick-necked animals the small tube may pass down the esophagus without causing any visible bulge of the skin over the esophagus; however, resistance on the tube, the way the animal acts, air in the tube, palpating the esophagus back of the larynx, and actually observing the tube as it goes down the esophagus, are all ways of determining just where the tube is directed. In case of doubt as to location of the tube one should never force medicine or liquids through it. It is better not to worm the animals than to take a chance of forcing the medicine into the lungs.

Many owners and not infrequently veterinarians object to the stomach tube. Owners because they think it is dangerous and because occasionally there is slight hemorrhage from the nose; veterinarians because they also think that it is dangerous and because it takes a little more time than it does to give a ball. I think, if the truth was known, quite as many horses have been injured from giving carbon disulphid and carbon tetrachlorid in gelatin capsules as there has from the use of the stomach tube. If a veterinarian doesn't know how to pass a stomach tube into an animal he certainly shouldn't try to do so any more than one would expect a dentist to undertake an operation for appendicitis.

The administration of anthelmintics to animals through a stomach tube, if properly done, gives assurance that the animal received all the medicine in the correct amount, at the right time, in the right place, and mixed with a vehicle of kind and quantity most favorable to enhance the action of the particular drug used. Those preparations that horses will take readily on the feeds are not wholly effective. Most of the efficacious remedies for parasites of the digestive tract of horses have a repulsive odor and taste and horses refuse to eat feed in which they are mixed. With gelatine capsules it is impossible to give the correct dosage and mixture except in the case of carbon disulphid. Oil of chenopodium may be given as a drench; however, my experience has been that it is easier to pass a stomach tube on twenty-five horses than it is to administer a drench to that number.

Most anthelmintics have a rather highly selective action, therefore one must take into consideration the particular species of parasite in the digestive tract to be removed, the selective action of the drug and the therapeutic dosage of each. Further, the apportioning of dosage according to age, size, and condition of animal, danger from administration of certain drugs used and the importance of real effective results are points not to be ignored. Taking all these into consideration, our experience and observation seem to show that the use of the stomach tube is the best method of administering worm medicines to horses and, often, other drugs to horses and animals in general.

W. W. Dimock.

A Brief Survey of the Veterinary Colleges of Europe

By A. F. SCHALK, College of Veterinary Medicine, Ohio State University

THE official veterinary tour of Europe by the American Veterinary Medical Association leading up to the International Veterinary Congress at London, August 4th to 9th, 1930, afforded an excellent opportunity to make a fairly good survey of a number of representative veterinary colleges, both upon the continent and the British Isles. In all, fourteen schools located in ten different countries were visited. Unfortunately the brief period of time available at each institution rendered it impossible to make a very exhaustive and detailed survey, nevertheless, the splendid professional courtesies accorded us on all sides enabled one to obtain a very good general idea of the conditions and activities at the various schools.

Among other things, I personally was more particularly concerned about the establishment of these "Grand Old Institutions," their physical plants and equipment, their internal organization, teaching personnel, curricula, and especially the requirements pertaining to the matriculation and graduation of the students as well as special training and preparation for the various fields of veterinary medicine.

Physical Plants and Equipment

At the very outset one is greatly impressed with the enormous physical plants of the average European veterinary school. The unit in a few institutions consists of a few buildings concentrated upon comparatively small land areas but for the most part there are several structures numbering ten, fifteen or twenty or more buildings scattered over large spacious grounds. As many of these schools have been established from one hundred to one hundred and fifty years, many of the buildings are not strictly modern in design. In some instances, other buildings, such as soldiers' barracks have been transformed or made over for veterinary school purposes, and under these conditions, the building space could not be utilized to the best economic advantage. In some institutions some of the professors are provided with living quarters within the veterinary buildings which also consumes considerable space. It is chiefly for these reasons, that the physical plants seem unusually large. It is highly probable that if they were to rebuild today that they could duplicate and perhaps greatly exceed their present building facilities with possibly one-third of the structural material used in their present plants if they desired to concentrate and build as economically as possible. They are to be congratulated upon the excellent sanitary conditions maintained in the most of the plants.

The grounds, particularly many of those on the continent, where they are usually more spacious and the schools better supported financially, are, as a rule exceedingly well kept and real spots of beauty. The courts and yards within the grounds, with a vast variety of perennial shrubs and flowering annuals, together with numerous judiciously placed shade trees give the buildings a truly colorful background, which otherwise might have a rather sombre appearance. One may ask, what has this to do with veterinary education? It simply means that veterinary institutions can be environed by a picturesqueness and artistry paralleling that of any other profession, business or industry.

In addition to the necessary amount of building space for lecture rooms, laboratories and the hospitalization of animals, the question of an adequate supply of up-to-date physical equipment and demonstration material for thorough and efficient teaching is of paramount importance in modern veterinary training. In this respect most of the Euro-

pean schools visited are very well equipped. A hundred or more years since their establishment has enabled them to assemble an elaborate collection of excellent specimens. This is especially true of some of the anatomical and pathological museum specimens in some of the large continental museums and laboratories. The writer could not help but marvel at the large number of delicate detailed dissections, the intricate injections and artistic modeling of various anatomical structures displayed by some institutions. They are indeed the handiwork of skilled artisans.

Foundation and Support

Five of the institutions visited are faculties of universities, three are veterinary high schools and six are national, state and so-called royal colleges. Those that are faculties of universities are governed entirely by the ministries of education. The veterinary high schools are under the ministries of agriculture and the national, state and royal colleges are controlled and operated by various supervisories of state or nation. It is current opinion that those maintained by the ministries of agriculture fare best in the way of financial support. If this is true, it perhaps can be explained on the basis that veterinary science is so closely associated and affiliated with agriculture that the minister of that department better understands veterinary conditions and needs. Aside from the financial aid mentioned, all the schools charge a tuition fee which varies considerably and most of the continental schools require the students to pay a small nominal fee for the lecture hours taken, which usually goes to the professor offering the course.

Internal Organization

When one makes an analysis of the internal organization of the different schools, he finds various policies pursued. Practically all institutions follow the alternate director plans. By this method a professor is elected by the faculty members to become director of the school for 2 years. The same director can be re-elected but for the most part the directorship in time is well distributed among the different professors. While such a plan may be criticized in some respects, the writer is of the opinion that it is not without its advantages. In this way a good man of unusual scientific attainments and professorial capabilities is not forever lost to his institution for executive and administrative work which in many instances is chiefly "mere chores." Possibly this plan can be followed to better advantage in the older, well established and strongly organized schools of Europe than in the younger institutions of America where strong personalities of powerful influence are needed for continued financial support of the institutions.

A. V. M. A. party placing a wreath on the tomb of the Unknown Soldier, Paris, France. In the foreground: Major J. D. Derrick, V. C., U. S. Army; Dr. Tom Smith, and Chief Mohler. In the background, other members of the party.

In the institutions surveyed, it was found that the departments range from six to sixteen. In most schools they are termed "Institutes" rather than departments. These classifications imply a preference to a few strong institutes with several sub-divisions or a larger number of smaller institutes of more definite and distinct limitations.

Each institute is headed up by a professor, known as an ordinary professor. He is usually ably supported by assistants as required, first assistant, second assistant, etc. in ranking order. As a rule the professors only lecture to the students. The assistants set up the equipment for demonstration, conduct the laboratory courses, make up the institutional records, and carry out the investigational work as outlined and super-

vised by the professors. Most schools maintain a couple extraordinary professors to replace the regular professor in case he becomes incapacitated or is called away from his post.

As a rule the upper assistants are highly trained men with many years of valuable experience who apply themselves faithfully and diligently. Often they stand in waiting many many years in conscientious employ, at financial sacrifice, hoping to attain their goal, a professorial position. In some of the smaller schools, they do not have the necessary assistants, and the professor, as in many of the American schools, is overburdened with excessive teaching duties.

Students and Their Requirements

The entrance requirements for matriculation in the Veterinary Schools are practically the same as those for medical and other science courses. The average age of the student entering college is about 19 years. This is slightly older than his American brethren. Their preliminary education requirements prescribe that the child begins school at 6 years of age and attends the Grund schule or elementary school until 10 years old. At this stage he may choose one of four courses, the Gymnasium (Grammar School), the Real Gymnasium, the Reform Gymnasium or the Oberschule. Each of these courses continue for nine years or classes and when completed the student is prepared for any of the University or college courses. Those entering the learned profession and particularly Veterinary Medicine, Medicine and other science courses, usually choose the gymnasia or the real gymnasia.

As regards class attendance, it was learned that in most schools attendance at lectures is optional with the student. However, it is quite necessary that he religiously do all laboratory exercises and practicums, as well as attend all clinics to which he is assigned.

Although compulsory attendance at lectures is not required, the fact remains that a large majority of the students are in quite regular attendance. This is evidence that the average student realizes and appreciates that much can be learned from a professor of wide experience and comprehensive training, that may not be recorded in text books.

Different methods are in vogue as regards examinations. Some institutions resort to the annual examination following each collegiate year. Practically all have abandoned the old conventional policy of one examination at the completion of the academic course. Perhaps a majority of the schools examine the students for the first time at the end of the first two years when they have finished the fundamental courses. Most colleges hold examinations again following the third year and a final examination at the completion of the course. Examinations are carried out in writing, oral quizzes and practicums. Apparently they are quite thorough and rather comprehensive. (The students that the writer consulted were indeed very highly concerned about passing their examination.)

The collegiate year is divided into two semesters, winter and summer. These semesters vary in length from 11 to 16 weeks and the actual amount of school time ranges from about 25 to 32 weeks per year in the different institutions. This is materially less than in the American College and University.

The time required for the completion of the Veterinary Course in these schools is 8 or 9 semesters, at which time a certificate only is granted to the student. This certification in all countries except two entitles the graduate to practice veterinary medicine in the country in which the certificate is granted after he has satisfactorily complied with the prescribed state examination. Certain states stipulate further special training and experience supplemented by successfully passing special examinations for meat inspection and state and federal sanitary control work.

Those desiring the degree of Doctor of Veterinary Medicine are required to do their "Dissertation," which corresponds to a thesis covering a research problem in our country. In some institutions the work for the Doctor's degree may be begun in the sophomore, junior or senior year of their undergraduate studies. Where this policy is pursued it is possible for the student to

complete his problem and receive his Doctor's Degree as early as two or three months after graduation. However, most of the colleges do not permit the student to begin Doctor's studies until undergraduate work is completed. Under such conditions usually one year or more is needed to obtain the Degree of Doctor of Veterinary Medicine.

Supply and Demand of Veterinarians in Europe

According to information gathered on the tour, every continental country visited has a marked over supply of veterinarians. In several of the larger continental cities it was learned that more than one hundred veterinarians were not attempting to ply their profession. These conditions did not prevail in the Islands, as many practitioners were seeking able veterinary assistants.

In spite of these overcrowded conditions young men continue to study veterinary medicine. When asked for an explanation we were informed that all of the other professions were likewise much overcrowded and inasmuch as most young men who can possibly afford it want to secure a college education, they think that the prospects in this field are as favorable as that in medicine, dentistry, law or in commercial and industrial lines.

I regret that our tour did not permit us to make a detailed survey of veterinary conditions as apply to the veterinary practitioner and the federal, state and municipal regulatory sanitary control work. It was, however, learned through the veterinary college authorities that at the present time veterinary practice is not in a very prosperous condition. In the larger cities small animal specialty work constituted the major part of the practitioners' activities.

Much more could be said about these "Grand Old Institutions" and the very splendid men who are guiding their destinies. However, to delve more deeply into details concerning them would make this communication too cumbersome. Withal, before closing I want to express my most earnest and sincere appreciations of the very cordial conditions and hospitable reception and consideration tendered us by the personnel of all the schools visited. They left nothing undone to make our brief stay with them pleasant, interesting and instructive. They made our tour a continuous procession of professional pleasantries and memories, never to be forgotten.

Dr. George Watson, Pathologist of the Health of Animals Branch of the Canadian Department of Agriculture, Lady Theiler, Prof. Chas. Porcher, National Veterinary School, Lyons, France, and Sir Arnold Theiler, formerly Director of Veterinary Eduction and Research, Union of South Africa. All four attended the 11th International Veterinary Congress.

When one loiters by the tomb of Pasteur, stands before the statues and busts of Bourgelet, Bouley, Ellenberger, Damman, Colen and Schutz and clasps hands with and visits the laboratories of Carré, Vallée, Calmette, Kitt, Ernst, Hutyra, Baum, Ostertag, Scheunert, Miesner and M'Fadyean there arises within a sense of immeasurable and irrepressible pride which leads on to renewed inspiration for greater endeavors and achievements in one's chosen profession.

PARAPHIMOSIS IN AN AGED GELDING

I have a case I would like your opinion on.

Subject: A thirteen year old gelding working daily in the harvest field. The owner noticed the penis protruding about eight inches and directed practically straight along the abdomen, with the result that when the animal urinated, the urine was deposited between the front legs.

A few days later, a swelling developed just back of the glands penis and he was brought in for examination. To make the explanation simple, this animal's penis felt like a stick of wood and was hard from one end to the other and normal in size, except for the edema which had developed and which was pretty well relieved by free incisions.

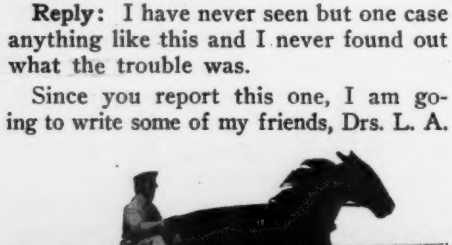
I then had this animal fed potassium iodid, one-half ounce per day, in the chop. I kept him for one week, when he was sent home to be turned out to pasture, and given the medicine night and morning.

However, I can see very little improvement and am at a loss to know what this condition is, or the proper treatment to apply. The animal is normal in every other respect. Temperature, pulse, etc., appetite good, though I felt he was over anxious for water.

Any information you can give me on this patient will be thankfully received.—H. E. McE., Manitoba.

Reply: I have never seen but one case anything like this and I never found out what the trouble was.

Since you report this one, I am going to write some of my friends, Drs. L. A. Merillat and Wm. Bell, who have had a long and extensive experience in equine practice, to see if they can give a solution.—J. F. D.



On page 406 of "Veterinary Surgical Operations," this form of paraphimosis is mentioned, but since that was written a good bit of water has flown over the dam. It has been possible to trace all of these cases that I have seen in recent years to enlarged prostate glands, but life is too short to meet enough of them to become a specialist on that form of the disease.

In discussing this particular type of paraphimosis before a veterinary association some years ago, the late Doctor John Adams said there was "no such animal" as paraphimosis from chronic erection; and that is that for one man's experience. I am glad you finally ran on to one of these cases so that you can vindicate me for mentioning them in my old work on surgery.

I believe that if one could perform prostectomy successfully, the animal would get well, but this is only a guess. We have always had to amputate the penis and take the consequences of that more or less unsatisfactory operation.

Doctor Adams gave a graphic description of cutting a four to six-inch cuff of skin from the penis and approximating the edges of the wide wound. In my hands, this would draw the penis back just that much and no more. So we abandoned that stunt and went back to amputating again. When I asked Doctor Adams how he would handle one that had a chronic erection, he thought I was kidding, and pronounced that type of the ailment as absolutely unknown.—L. A. M.

The case you describe is one with which I have had some experience, and in one instance an opportunity to autopsy. I called it a block in the return flow, but could not determine the cause. The corpus cavernosus and the corpus spongiosum were solid fibrous tissue. He had lived about a year after he became af-

fected and worked well on the farm. That was back in the nineties.

In 1902, there was a case in a hospital here in a man that attracted a good deal of attention. Our best surgeon at the time, Doctor Douglas, said it was caused by a tumor on the brain and was purely a nervous affection. His treatment of the case was successful. I told him of the cases I had had and the post-mortem findings. It was his opinion that it was purely a nervous disturbance.

I tapped the cases I had and when the edema was overcome, there was some atrophy.—W. M. B.

VARIATION IN MILK PRODUCTION AND IN FLUID MILK CONSUMPTION

The consumption of fluid milk in cities is quite uniform in amount throughout the year. In an investigation undertaken in New York City, Chicago and Pittsburgh, it is found that the demand was lowest in August when it attained 97% of the twelve month average. The demand was highest in June, reaching 103% of the year's average. Thus, the variation in demand was only 6% during the year.

The production of milk in the districts supplying these three cities, on the contrary, fluctuated materially, the highest production occurring in June, when it reached 137% of the twelve-month average, the lowest in November, when only 79% of the twelve-month average was produced.

Formerly the production of milk varied far more during the year. Prior to 1906, the production of milk was so low during the winter months, that butter and cheese factories were operated only nine months in the year, closing down during December, January and February. In 1905, the production of milk in June was eight times the volume of production in November. Now, only a little more than one and one-half times as much milk is produced in June as is in November.

An attempt is being made to further equalize the production of milk throughout the year by grading the price according to the amount produced. Thus, an average production will be set for a farmer, for which he will be paid a standard price. On his production in excess

The production of milk reaches its highest point in June and its lowest point in November. The June production is 58% greater than the November production. Twenty-five years ago, the June production of milk was 800% greater than the November production.

of this average, he will be paid a lower price.

About 50% of the milk production in the United States is used in fluid form.

DAIRY MERGERS

Mergers in the dairy industry continue at a pace that kills—competition. The "Big Three" in the industry acquired 74 major companies in 1930; Borden acquired 41, Beatrice 19 and National Dairy 14. Smaller corporations have followed their lead; U. S. Dairy Products Corporation acquiring 15 new units, and Western Dairy Products several. Mergers are under way or being considered by more than 50 groups of independent dealers. A recent tabulation lists over 6,400 independent milk dealers, 4,300 cheese makers, 5,000 butter makers and 4,500 ice cream plants. The per capita consumption of practically all dairy products is steadily increasing.

Fowl Typhoid of Turkeys

By W. R. HINSHAW, Davis, California
Associate Veterinarian, California Agricultural Experiment Station

FOWL typhoid is apparently of greater economic importance among turkeys in California than blackhead, a disease that causes immense losses in some sections of the United States. Few references to fowl typhoid of turkeys can be found in literature, probably because little or no research on this disease in turkeys has been done. During the past year the author has had an opportunity to study outbreaks of fowl typhoid in turkeys on 11 ranches in central California, and this paper is based on those studies. In each outbreak the field diagnosis was confirmed by isolation of the causative organism.

Characterization

Fowl typhoid in turkeys is identical with the disease of the same name in chickens, is a specific infection having the characteristics of a septicemia and is caused by *Salmonella gallinarum*. Cultures of this organism isolated from outbreaks of fowl typhoid in turkeys have been culturally similar to those isolated from outbreaks among chickens. Flocks grown in confinement have appeared more susceptible to fowl typhoid than those raised on open range, and contact with chickens, or yards used by chickens, apparently has been an important factor in the spread of the disease to turkeys.

Symptoms

In the outbreaks studied, turkeys suffering from fowl typhoid presented a typical picture of a septicemic disease. They became listless, refused to eat, had a tendency to separate themselves from the remainder of the flock; and usually showed a greenish to yellowish diarrhea. Many died without having previously shown any symptoms. The temperature was elevated from two to four degrees. The average temperature of normal turkeys as determined on 21 birds from three farms was found to be 105.9 deg. F. These birds had a temperature range of 105.2 deg. to 106.8 deg. F. In contrast to this average normal temperature, the average temperature of 19 visibly sick turkeys from seven farms was 109.1 deg. F. with a range from 107.2 deg. to 110.2 deg. F. Two other birds nearly dead from the disease had temperatures of 106.8 deg. and 105.4 deg. F. respectively.

Post Mortem Findings

The lesions seen on autopsy were similar to those observed in chickens, but appeared to be more constant. The birds nearly always died in good flesh, because of the short duration of the disease. The muscles of the breast instead of being pale as in chickens, had a tendency to be congested, but in many cases had a partially cooked appearance. The heart was usually swollen and either contained small grayish areas of necrosis or petechiae and in a few cases both have been observed. The liver was friable and consistently enlarged from two to three times its normal size. It was most often bronze to mahogany colored or covered with a mixture of bronze and mahogany colored streaks. Pin point areas of necrosis have also been noted, though not consistently, and on cutting the blood flowed readily. The spleen was always enlarged two to three times its normal size and was friable.

The crop as a rule contained some food, which indicates paralysis of the digestive tract, since birds seldom eat after symptoms appear. The mucous membrane of the proventriculum was sloughing in most of the birds, and in two this organ was filled with a gelatinous exudate. The gizzard usually contained food and the lining could be easily removed. With few exceptions the intestine was anemic in appearance when viewed from the exterior and ulceration of the mucous membrane was plainly visible through the serous membrane. This ulcera-

tion was most severe in the duodenum, but a few ulcers which were from 0.5mm. to 4mm. in diameter could be observed throughout the intestine and extending to the ceca. Hemorrhagic enteritis was common, especially in the duodenum.

In most birds the lungs presented a parboiled appearance and often were more firm than normal, due to minute caseated abscesses. The kidneys as a rule were enlarged and a few showed some petechiae.

The enlarged mahogany or bronze streaked liver; the enlarged spleen; the areas of necrosis in the heart; and the grayish colored lungs appeared to be pathognomic in the cases observed. Hemorrhagic enteritis and marked ulceration of the intestine, although uncommon in the disease in chickens, seemed to be more or less consistent lesions in turkeys. Pure cultures of *Sal. gallinarum*, the causative organism, were readily isolated from all organs, including the bone marrow. In case of birds that had been dead for some time, pure cultures were more easily isolated from the bone marrow than from the liver, spleen and heart blood.

Mode of Transmission

That chickens play an important role in the transmission of fowl typhoid to turkeys is evident from the studies made to date. In five of the 11 cases studied, evidence that the turkeys had access to chicken yards was obtained, and in all of these the chickens had at some previous time suffered from a fowl typhoid-like disease. The outbreak reported below was investigated to obtain information on this relationship and illustrates the need for keeping turkeys separated from chickens and chicken yards.

Two brothers, after selecting their breeding turkeys and marketing the remainder, moved the breeding flock of 273 turkeys from the range to the ranch yard of one of the brothers. The birds were placed temporarily in a chicken yard with 13 apparently normal chickens, which were the remains of a flock of 50 that had suffered from an acute disease three months previously. Within seven days, a few of the turkeys refused to eat, became listless and had a greenish to yellowish diarrhea. On December 30, 1929, which was about a week after the first sick bird was observed, there were, according to the owners, approximately 40 showing visible symptoms and two had died. These two were found to have died from fowl typhoid, the causative

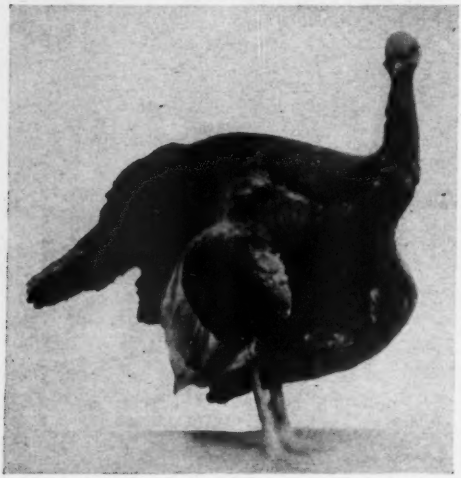
Turkeys should be kept isolated from chickens.

organism being isolated from each. As soon as symptoms appeared, the flock was moved to a range about one half mile from the ranch yard where turkeys and chickens had not been kept and where there was plenty of green pasture. On December 31, 1929, a field trip to the ranch was made, and 15 or 20 visibly sick birds were observed. The owners reported that they had noticed a marked improvement. Temperatures of four visibly sick birds were 109.8 deg., 110.2 deg., 110.0 deg., and 109.6 deg. F. respectively. Temperatures of three normal appearing birds were 106.0 deg., 106.4 deg., and 105.2 deg. F. respectively. Six birds had died to date. Another field trip to the flock was made on January 5, 1930, at which time the flock appeared much improved. Two birds had died since December 31, making a total of eight to date. A third trip was made on January 13 and no more visibly sick birds could be seen. No more losses had occurred.

The only control measures used were to remove the birds to a clean range, and to substitute milk for drinking water. No other change was made in the ration. Epsom salts at the rate of one pound per 100 turkeys given when symptoms were first observed was the only treatment.

To obtain information regarding infec-

tion among the chickens, blood samples were collected from the 13 chickens which continued to remain healthy until killed. The blood samples were subjected to the agglutination test, using an antigen prepared from a tested culture of *Sal. gallinarum*. Eight of the 13 chickens gave positive reactions to the agglutination test and from one of two of the reactors secured for autopsy, a



Blackhead causes immense losses among turkeys in some sections, but in California, fowl typhoid of turkeys is of greater economic importance.

pure culture of *Sal. gallinarum* was isolated from the ovary. This indicates that the turkeys contracted fowl typhoid by contact with the infected premises or by contact with the 13 chickens.

Course of Disease and Mortality

The course of the disease appeared to vary directly with exposure to infected premises. In one outbreak, where the owner was unable to remove his flock to clean range, the losses continued from the first of September until the middle of December. In this instance the heavy losses occurred from the first of September to the middle of October, and during that time the disease seemed to abate and recur in intervals of a week or 10 days. Approximately 100 turkeys died in the flock of 275 during the six weeks. On October 21, the flock appeared normal, but on November 8 symptoms appeared again and pure cultures of the causative organism were isolated from three turkeys on November 11 and 15. Five birds died during this cycle, which lasted about 10 days, and no trouble was experienced until December 12 when a 15-pound turkey hen died and a pure culture of *Sal gallinarum* was isolated.

In contrast to this outbreak is the one described under MODE OF TRANSMISSION, which lasted only from December 22 or 23 until January 8 or 9, with a mortality of only eight birds out of a flock of 273. It will be of interest to note here that in this flock an agglutination test made on January 13 revealed only two reactors, which suggests that the agglutinations do not remain long in birds that recover, since at least 35 turkeys apparently suffered from the disease and made complete recoveries.

These two examples are typical of observations to date, regarding the time the losses continue. Removal of infected flocks to clean range apparently influences the mortality. A common history received from turkey growers who have had trouble with fowl typhoid is that an occasional bird dies with fowl typhoid-like symptoms during the season and that further losses can be prevented by changing the runs as soon as a bird is seen with symptoms.

The highest mortality reported in the outbreaks observed was 169 out of a flock of 175, but this flock was poorly managed, and was suffering from tapeworm infestation as well as from fowl typhoid. The average mortality in four flocks where accurate data were available was 26.5 per cent. The flock just mentioned is not included in this calculation since it was not considered a typical example because of the complications existing.

Prevention, Control, and Treatment

Although the data collected to date is limited, it is apparent that an important preventive measure is to keep turkeys entirely isolated from chickens or chicken yards. This procedure will also do much to prevent other diseases such as blackhead. In

case of an outbreak, removal of the birds to a clean range every few days, until all symptoms cease, is recommended. Substituting milk for drinking water will help to keep nourishment to the birds that will drink but not eat mash or grain. A mild laxative the day before changing range is also recommended in order to eliminate as much as possible of the infection before transfering to the clean premises. Removal of all other feed and giving the birds all the liquid milk they will drink, or the use of the 40% milk mash used in coccidiosis control for a day or two is probably less drastic and just as effective for accomplishing this purpose as epsom salts. The usual recommendations regarding cleaning and disinfection, and general sanitation are also necessary in the prevention and control of fowl typhoid. The use of antiseptics in the drinking water, if water is used, may be of some value, but the constant use of fresh drinking water in cleaned and disinfected water fountains is probably just as effective. Intestinal antiseptics have not proven entirely successful in the treatment of fowl typhoid in turkeys. Immunization with autogenous bacterins has not been althogether successful in the few trials made.

PROGRESSIVE VETERINARIANS OF ILLINOIS

Thirty-one Illinois veterinarians attended the school of instruction on Bang abortion test commencing on September 9, 1930, at the University of Illinois. Twenty-six attended the school of instruction on abortion disease at the same place, September 16th. Fifty-two attended the pullorum disease school of instruction September 22nd.

Thus, in September, 109 Illinois veterinary practitioners left their practices for a week to fit themselves to better serve their clients. Incidentally, the farm press did not overlook this manifestation of a desire on the part of veterinarians to render an ever better service to the live stock industry of the state.—I. V. M. A., Press Release.

Successful animal husbandry rests upon two fundamental principles, viz.: hygiene and economics. Hygiene in relation to animal husbandry particularly relates to abortion and sterility, problems that can be successfully controlled only by qualified veterinarians. The practical part of animal breeding and the provision of proper feed for the economic production of live stock is the domain of the agriculturist.—Markowski, Poland, at the 11th Inter. Vet. Congress.

In Spain the practice of veterinary medicine has been protected by numerous legislative enactments since the sixteenth century. At the present time only those who have graduated from veterinary colleges are permitted to practice. The Spanish penal code inflicts imprisonment for four months to two years and a fine of 1000 to 5000 *pesetas* on all of those who are not qualified graduate veterinarians. There is also a meat and milk inspection service and since 1928 all of the inspectors in this service are graduate veterinarians. Thus Spain recognizes the value of an efficient veterinary service.—E. Sanz Egand, Madrid, at the 11th International Veterinary Congress.

"The diagnosis of hog cholera presents no difficulties during the acute stage of the disease. It is exceptional, however, for a diagnosis to be arrived at by clinical examination alone, but the nature of the disease quickly becomes apparent on examination of an animal that has died, or has been killed, when seriously affected. The virus of hog cholera produces petechial hemmorrhages and hemorrhagic extravasations in all organs. *Hemorrhages of this type occur in no disease of the pig other than hog cholera.*" The foregoing statements occur in the English translation of a paper on hog cholera that was given by Nusshag of Berlin at the International Veterinary Congress. The statement concerning petechial hemorrhages and hemorrhagic extravasations may apply in Germany, but is not regarded as applying to swine diseases in the United States.

Capillariasis Vesico-Urethralis of Silver Foxes

By FRITZ VOLKMAR, Columbus, Ohio

OF THE trichuroid nematodes, characterized by their lemon shaped ova, the fox harbors three species. They are: *Capillaria aerophila, Trichuris depressiuscula* and *Capillaria plica*. The ova of each one of them may be found in the feces, although the respective parasites inhabit different tissue-cavities. With such divers and widely apart seats as the bronchi, the cecum and the urinary bladder, it is evident that effective treatment must depend on a correct interpretation of the finding of ova, if any dependence is to be placed on them for differential clinical diagnosis. But their similitude is so striking that their gross appearance under the microscope does not give a clue as to the species involved. The need and importance for more delicate means of differentiating these ova is therefore obvious. Fortunately, there seem to be definite differences in size, which, if abundantly confirmed, could be used for the determination of the species present.

Recently it was the good fortune of the author to find *C. plica* on two occasions of autopsies of a silver fox. The foxes were raised on a ranch near Westhope, Bottineau

The fox harbors three species of trichuroid nematodes.

County, North Dakota. Previously to this observation, *C. plica* had not been reported as occurring in North Dakota. It seemed advantageous to make use of the opportunity by measuring 50 ova, found free in the urinary bladder of these two foxes.

The eggs of *C. plica* are evidently the smallest of the three kinds. The earliest measurements are those of Dujardin (1845a). He gives the size of the eggs as 60 by 30 micra. No dissentient measurements have evidently been reported, since these sizes are quoted in all the subsequent textbooks on parasitology. The measurements of the author indicate that the size of the eggs is nearly constant and varies within very narrow limits only. In the fresh material at his disposal the length (including both plugs) varied between 63 and 65 micra, and the width between 27 and 28 micra. In eggs embedded for some length of time, there evidently occurs a readjustment of the tension, for on reëxamination of the same material about six months later, the average size of the eggs was found to be 58 by 32 micra.

Dujardin (1845a) gives the size of the eggs of *C. aerophila* as 79 micra in length, Hall[1] as 67-72 micra in length; the width is given as 35 micra. The eggs of *T. depressiuscula* measure, according to Railliet[1], 72-80 micra, according to Hall, 77-86 micra by 37-40 micra wide.

Aside from the interesting similarity of the eggs of the urinary bladder worm to the eggs of the lungworm and the whipworm, and aside from the resulting complication of the diagnosis of the affections in question, *C. plica* merits increased attention on account of the severe lesions in the urinary bladder, usually found associated with the presence of this parasite.

C. plica is a very fragile, threadlike worm, of a yellowish color, barely visible to the naked eye, belonging to the order Trichinelloidea. The male is said to measure

[1] Hall (1924). Diagnosis and treatment of internal parasites.

13-30mm. in length, and the female 30-60mm.; the greatest thickness is about 0.09mm. The sizes of those observed by the author lay within this range. The worm may occur in the kidney as well as in the urinary bladder. Besides in foxes, the worm has also been found in the wolf and in the dog.

The mode of transmission is not known at present. It is assumed—by analogy with the known life-cycle of other nematodes—

Capillaria plica infests wolves occasionally.

that the infective eggs are taken up with contaminated food or drink and deposited in the digestive tract. There they hatch and the larvae penetrate to the blood—or lymph-stream. Finally, through chemotropic influences, they reach the uropoietic system where they develop to maturity in the urinary bladder.

In both autopsy cases the wall of the bladder was found considerably thickened and the mucosa appeared swollen and exhibited intense diffuse reddening. The bladder was distended with retained urine. The urine which contained much sediment and pus was cloudy and of a bloody color.

It is reasonable to conclude that the worm merely plays a predisposing rôle in the etiology of the urocystitis. Undoubtedly the cystitis is produced by microbic invasion, ascending from the urethra. The entrance of bacteria into the tissue is favored by the mechanical injury from the parasite and possibly also as a consequence of the irritating contact with the sticky layer of adhering eggs.

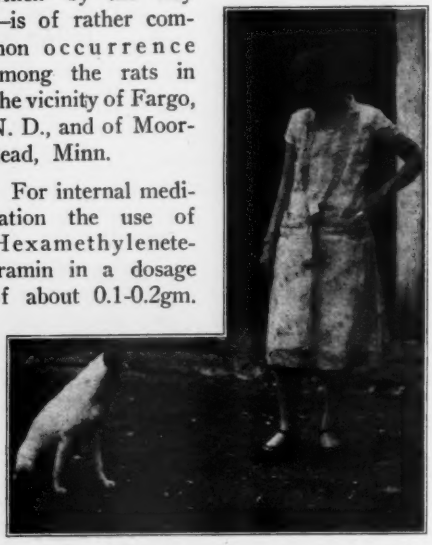
With the premise of a bacterial origin of this cystitis conceded, it is evident that with the continuation of the predisposing cause and the persistence of the cystitis, the involvement of other organs may be expected and grave bacteremia and fatal uremic symptoms must ultimately result. As a matter of fact, in the two autopsy cases under consideration, the additional evidence, from other inflammatory lesions found, pointed to uremic poisoning. The history, that "the foxes exhibited pronounced weakness and appeared completely paralyzed," is likewise suggestive of uremic coma, preceding death. The owner claimed to have lost two other foxes a short time before, showing identical behavior.

When such or similar alarming symptoms are observed, it would then be advisable to examine the urine of all the foxes on the premises for the presence of worm eggs. If eggs of C. *plica* are found, the use of a cytoscope would be the surest and quickest means of detecting those foxes in which a cystitis already exists. Other methods of physical examination, as used in canine practice, to establish local tenderness, may also be relied upon, such as the external palpation of the urinary bladder from the abdominal wall. If the kidneys are involved, tenderness over the loin would be found present. It is also well, if worm eggs have been found, but cystitis has not made its appearance yet, to watch for symptoms of dysuria and of ischuria and to analyze the urine chemically and microscopically at regular intervals.

The logical treatment for cystitis consists of mild antiseptic irrigation. Especially

recommendable on account of its strictly non-poisonous and non-irritating property and its penetrating action into the deeper layers of the tissues are irrigations with oxycyanid of mercury in dilution 1-5000. While nothing is known concerning its parasiticidal action on the worms in question, it is safe to assume that even if such action is absent, the mechanical force of the irrigation is likely to flush out some of them and if repeated often enough, possibly all, since the lumen of the catheter is usually at least 1mm. or more, while the thickness of the worm is less than 0.1mm. in diameter; besides, the attachment of the worm to the mucosa is not so firm as in the case of the related species *Trichosomoides crassicauda,* which—by the way—is of rather common occurrence among the rats in the vicinity of Fargo, N. D., and of Moorhead, Minn.

For internal medication the use of Hexamethylenetetramin in a dosage of about 0.1-0.2gm.



Like foxes and wolves, the dog too is sometimes a host to Capillaria plica

(3-6 grains) would be indicated and should prove efficient due to its disinfecting action during elimination through the kidneys by its ability to split off formaldehyd. A laxative diet and non-stimulating foods are other essentials of proper nursing.

From a prophylactic point of view the preventive method developed at the Ontario Government Experimental Fur Farm deserves mention.[2] It has been found there, both with *C. aerophila* and *C. plica,* that such sanitary measures which will deprive the ova of their proper medium for ripening—thus rendering the eggs non-viable—not only could check reinfestation in the

Egg of capillaria plica.

carrier and prevent spread to healthy foxes, but will also cause the parasitized foxes themselves to convalesce.

ANSWERS TO "HORSEY" QUESTIONS

I notice in the September 1930 issue (Page 359) of VETERINARY MEDICINE the following questions, on which I offer the following suggestions.

No. 1. How break a horse or mule of halter pulling?

Answer: Take a rope twenty feet long or longer (I use a lariat with metal hondo), place the loop around the body just in front of hips with the hondo under the belly, pass the rope between the front legs, up through the chin piece of the halter and tie to something a little higher than the horse's head so when the rope is tight it does not pull down on the head, and let him pull on it. He may pull the second time, but if the rope is properly adjusted and he ever lays back on it the third time, you will have the eighth wonder of the world. It is a good plan to keep the loop rope in place for a few days on confirmed pullers.

This does not guarantee that a horse will never pull again as he might take up the habit again some time when he has forgot-

[2] Bul. No. 2, Dep't of Game & Fisheries, Toronto, Ontario, Canada. (1930.)

ten about the cure. I have seen men cured of the liquor habit and go back to it.

No. 2. Is there an effective method of breaking a horse that kicks while hitched?

Answer: There are several methods that may be used with more or less success. What will work with one horse will not work on all horses. I think I have had the best results from the use of the W hobble. A good long month on the gang plow helps this kind. Any method used must be mixed with a liberal amount of judgment and common sense. It is like the boy that was making his dog do tricks on the street. A man said: "Sonny, I have a very fine dog at home and I can't make him do any of those tricks." The boy said: "Well, Mister, when you train a dog you must have more sense than the dog." The same applies to training horses.

No. 3. What is the cause and treatment of chest founder?

Answer: If there is such a condition, the Lord only knows the cause and treatment and to use Dr. E. T. Baker's expression: "He has made no Divine revelation on the subject so far as I know."

No. 4. Is cross firing a serious defect?

Answer: Yes, a horse cross fires at a certain rate of speed. Find what that rate is and drive him faster or slower.

No. 5. How overcome a lugger?

Answer: Use a bit that is severe when he lugs and easy on him when not lugging. This is also a place where you will have to draw on your stock of horse sense. Use what knowledge you have, some judgment and plenty of profanity. If this fails, trade him off. In making the trade, don't mention the lugging unless you are asked, as the horse may want it kept secret.

No. 6. What is the meaning of the statement "Smokes his pipe"?

Answer: Not being a smoker, I don't know. It seems I have heard it is a nonsensical term for a stump sucker.

No. 7. Can "winging" be prevented by shoeing?

Answer: This is a very hard condition to control. However, it can be helped by using a square toed shoe and lowering the foot on the outside, being careful not to lower it enough to put too much strain on the joints of the foot. Don't tell your client you can absolutely control this condition. If you do and you go out and shoe this horse using your best judgment, collect a good fee and think your trouble is over, and in two or three weeks, while sitting in your office you see the owner of the horse "winging" down the street, headed for your office and looking like he was going some place, just slip out the back door, sneak up the back alley, keep on going and don't come back, for what

that fellow is going to say to you will be aplenty.

No. 8. What is the cause and treatment of "tongue lolling"?

Answer: Tongue lolling, I think, is caused by irritation of the bit or by a colt fighting the bit which seems to become a habit later. A horse that lolls the tongue generally carries the bit under the tongue. Use a bit that is easy on the horse and has some appliance that will prevent the horse from getting the tongue over the bit. In the good old days when I was handling trotters, we used a bit with a round disc attached that lay over the tongue which prevented the horse from working his tongue over the bit.

It is always well to look after the teeth in these cases as they sometimes are causing the trouble.

Labelle, Missouri. A. D. Glover.

The Veterinary Supply House

By E. T. BAKER, Moscow, Idaho

WE HAVE often wondered if the average practitioner appreciates the value and service given by the various veterinary supply houses?

As we glance back over the past twenty years in active practice, the advance in veterinary therapeutics has been simply amazing. All branches of our profession have contributed to this condition. The laboratory worker, the biochemist, the bacteriologist, the pathologist, the pharmacist, the editor, the salesman and the clinician have all played their parts.

Twenty years ago we vividly remember an outbreak of hog cholera in this community. We had to send to Kansas for serum, and, by the time it arrived, most of our patients were safely in hog heaven.

In an outbreak of hog cholera, we had to send to Kansas for serum. Most of the herd was in hog heaven when it arrived. In the interest of conservation (and to save labor) the farmer of 20 years ago fed the carcasses of animals that had died of disease or other causes to the chickens or the hogs.

Thousands of sheep died from what was then diagnosed as "infectious pneumonia." We had one client lose over 1500 in one winter. With the coming of hemorrhagic septicemia biologics, these outbreaks have been largely controlled.

Treating canine distemper was a veritable nightmare. We remember one epidemic that swept over a large city. We called it "Stuttgart plague," and a number of other names under our breath, for it really was discouraging to even attempt treatment. While distemper is far from being conquered at the present time, yet the results are improving.

In those days, the veterinary practitioner had to work out his own salvation. Several of the larger pharmaceutical houses devoted a few pages in their catalogs to veterinary supplies, which they kindly sold to the stockman or layman at the same price charged veterinarians. Blackleg biologics were distributed by the government as freely as garden seeds, and they also compiled several vet-

erinary textbooks on horses and cattle to help obviate the need of the services of the graduate practitioner. In fact, it has been only within the past few years they learned of the existence of the private practitioner.

Proprietary medicines were sold in every country store, and later on, distributed from wagons or autos by agents. County agents, in their endeavors to save the country, jumped in bravely with hypodermic syringes and offered all kinds of free treatment. Unfortunately, they were unable to diagnose many diseases,

Proprietary medicines were sold in every country store and the clerk always had a "sure shot" colic drench.

and their efforts were wasted on the desert air.

However, in "them good old days," the veterinary instrument industry thrived. Those were the times of large equine practices, such as Doctor McKillip's in Chicago, and we had many "tools" to purchase. The orthodox veterinary sanctuary had a large glass case in which were hung many and various instruments. Speculums, dental forceps, trephines, obstetrical do-dads, casting harnesses, surgical devices, and dozens of other paraphernalia adorned "Doc's" office. Add the pungent aroma of creolin, carbolic acid, and various blisters, and we had a typical old time office.

Autos were then beginning to appear, but the average practitioner laughed to scorn the mere suggestion equine practice might not be as good in the future as in the past. Hundreds of veterinarians

Thousands of sheep used to die from what was called infectious pneumonia. Hemorrhagic septicemia biologics have enabled us to control this condition.

were making good money, but very few accumulated a competence.

Came the war, as the movies say, and with it years of feverish activity, followed by a period of reconstruction. Horse power was relegated to the rear by motive machinery. Equine practice began to fall off. Farmers found themselves

The kiddies never get quite the thrill from riding in a shiny new "Model A" that they did from a trip on the upper deck of Old Molly.

unable to sell their products at a profitable figure. Taxes had mounted, for the army of salaried officials never grows less. Land, conservatively worth $75 per

acre had sold for $250 to $500. Mortgages had accumulated, and people had let their debts go to purchase new cars

Hundreds of veterinarians were making good money but very few of them kept any of it.

or spend the winter in California.

Then came the inevitable business "repression," that Amos n' Andy discuss, with unemployment, floods, droughts, stock market crashes, and a general financial constipation all around. What happened?

The lean years swept many men out of the profession, and the colleges dropped

The county agents jumped in bravely and offered all kinds of free treatment.

in their enrollment. In many places intense competition gave way to only one man in a location, enabling him to make a fair income. Small animal practice picked up, and dairy work always was good.

The veterinary supply houses proved their worth at this crisis. Beginning in a humble way some fifteen years ago, and manned by experienced veterinarians, they gave satisfaction from the start. Previous to that time, we would have our order filled by some drug clerk who thought a float was some kind of a house boat, and who sent us what he thought looked "shiny" instead of what we wanted.

To our great surprise we found orders quickly and correctly filled. We began to receive little circulars from these

Filing a remonstrance

The drug clerk thought a float was some kind of house boat.

houses, and helpful suggestions began to creep into their pages. Specialties of immense value were perfected for the practitioner cheaper than he could com-

Whorled milk weed. Poisonous plants take an immense toll of live stock on the range.

pound them himself and in a more elegant form. Aromatic disinfectants; compressed tablets; biologics; ointments; elixirs, and other specialties came into being. We were often supplied with a bottle of some new compound to try out in our practice, and in this way we began to become familiar with new methods of treatment that brought success and good results.

Most of these houses declined sales to any but veterinarians. In this way, they performed a greater service than many of our associations or their officials. There is a vast difference between telling the practitioners how much one loves them and harpooning them in the back at the same time.

The local drug store continued to be patronized by the practitioner who only purchased specialties from the supply house. There is always a place for the local drug store, just as there is for the local veterinarian.

At the present time the private practitioner has these weapons to fight with: His individual business acumen; his bank account; enough clients with sufficient live stock; veterinary magazines; associations, and supply houses.

We cannot over value the ethical supply house, for it supplies us with the very sinews of practice. It helps us keep a jump or two ahead of the handy stock man who has received a short course at his state college and who is a full-fledged quack. We only wish we had enough business to patronize all the ethical supply houses. We certainly appreciate their assistance in practice, and we wish them all the prosperity they deserve, now, in 1931, and always.

I thank you.

Wheat can be substituted for corn in any of our livestock rations up to one-third of the amount of the ration. So can rye and oats. Even greater amounts of barley may be used and in most cases, as good or better results will be obtained. An exception to this is hogs, which seem to be able to get even better results from wheat but not so good with oats. — Editorial, *Successful Farming.*

The most important predisposing causes of poultry diseases are: overcrowding, poor ventilation, poor construction of houses, poor or insufficient diet, improper drainage, and filth. The diseases that are apt to occur as the result of such are: colds, roup, pox, flu, fowl cholera, fowl typhoid, tuberculosis, coccidiosis, and intestinal worms. These may occur without any of the predisposing causes operating but the chance of their occurrence is increased a hundred fold if the predisposing causes exist.—Chas. Murray, in *Successful Farming.*

St. Johnswort, long considered a plant poisonous to cattle and sheep, seldom causes death and is not likely to be a source of much loss to stockmen because of its toxic properties, is the conclusion of officials of the U. S. Department of Agriculture as a result of a series of feeding experiments. Details of the investigations are given in Technical Bulletin 202-T, Toxic Effects of St. Johnswort *Hypericum perforatum* on Cattle and Sheep, just issued by the department.

Avian tuberculosis is a relatively common disease in many sections of the country. Five and one-half per cent of 850,000 fowls tested in 1928 on 6127 farms in 33 counties of Illinois were found to be tuberculous. Approximately 45% of the flocks tested were infected. Over 75% of the diseased birds were over one year of age. Swine are susceptible to avian tubercle bacilli and the widespread prevalence of avian tuberculosis among chickens accounts for the prevalence of tuberculosis in swine. —Cir. 354 Illinois.

Relative Toxicity of Santonin and Oil of Chenopodium

By FREDERICK R. WHIPPLE, Chicago, Illinois

THIRTY years ago as a veterinary student, I was taught that santonin was the drug par excellence in the treatment for round worms in small animals. Merillat (1899) in his lectures on Special Therapeutics, stated: "santonin in proper doses is used exclusively at the McKillip College in the treatment of round worms of dogs and cats." Young (professor of canine and feline medicine, McKillip College, 1900), considering the subject of intestinal parasites in small animals, said: "santonin is the only drug to be thought of in treating dogs and cats suffering from round worm infestation."

Leaving college with the above instilled in my mind, santonin became my standby in treating small animals infested with round worms and for years it remained the only drug used in my practice for this purpose, and I can truly say that in all the years I continued to use santonin I never met with a single accident from its use—always reliable in removing the intestinal parasite (round worms) and not once did I notice any unpleasant after effect of the drug. As time passed on this drug was prescribed when indicated to all hospital patients and dispensed for the home treatment of round worms and not once have I ever heard a client complain of the treatment, but on the other hand not infrequently would they laud the treatment and report large numbers of worms passed.

Some few years ago when the cost of santonin jumped from one dollar per ounce to 10 to 12 dollars per ounce, I was tempted to try a cheaper substitute for santonin, viz., oil of chenopodium, but it was not long until I realized something was wrong—I was in most of my cases removing the intestinal parasites with the substituted drug, but found my death rate of patients treated was alarming, and so often owners would remark to me—"how severe your treatment is—it is worse than the worms." Not infrequently when oil of chenopodium had been prescribed as a home treatment for intestinal parasites, the owner would call on the phone shortly after giving the remedy and say, "Doctor, I think my dog (or cat) is going to die—it is terribly sick—vomiting, passing blood and will not eat—if I had known your medicine would have made it so sick I would never have had it treated for worms." It was in such cases the excuse book "Dr. Alibi" would have to be used, and chenopodium defended by saying, that no doubt the animal had absorbed too much of the toxic material secreted by the parasites, or some other manufactured excuse. Especially would some excuse be needed in defending chenopodium when given to the very young and weak puppy or kitten, for it is in the very young animal that chenopodium is most dangerous and often fatal in its action. In many of the cases treated with chenopodium, the period of convalescence is of several days' duration, due to the severe inflammatory condition set up by the agent in the gastro-intestinal canal and not infrequently a fatal enteritis follows its administration. I soon learned it is an extremely dangerous agent in cats and especially so in young kittens.

After several sad experiences with oil of chenopodium in everyday practice treating small animals suffering from round worms, I discontinued its use and returned to santonin, the action of which I had always found to be safe under all conditions. I say "safe" because I do not believe there was ever an animal harmed by using santonin in reasonable sized doses. In fact I am of the opinion

the lethal dose is so large that it is practically impossible to kill an animal by its use if by mishap very large doses were given. I am certain that in five, ten and even fifteen times the dose needed to remove intestinal parasites (round worms) santonin remains a safe and harmless drug to the patient to which it is administered. I say "reliable" because I believe santonin is as near 100% destructive to round worms as any other agent known.

I have always found santonin a reliable and safe drug in many years of practice, but from time to time have read in accepted textbooks of dangers that might follow its administration. Believing it to be of the interest of the veterinary profession, I was prompted to carry on a series of experiments to determine its toxicity, if any, in reasonable and even excessive doses. I am surprised at some of the statements made by such authors as Hoare, Hutyra and Marek, and Hand-Book of Therapy, (American Medical Association) etc., unless the doses given were in amount many times those ever recommended as a proper medicinal dose of santonin. I quote from the above named texts.

Hoare (A System of Veterinary Medicine page 1554) states American Wormseed (oil of chenopodium), has practically replaced santonin at many practitioner's hands, on account of the dangers of that drug to young animals. Instead of santonin, he recommends a gunshot mixture, composed of oil of chenopodium, oil of turpentine, oil of aniseed, nitrous ether, castor and olive oils. A mixture which is nauseating in nature and in reality extremely irritating to the gastro-intestinal canal.

Hutra & Marek (Pathology and Therapeutics of the Diseases of Domestic Animals) recommend santonin, but caution the user of it in weak and young foals. They mention it as the drug for dogs suffering from round worms.

Hand-book of Therapy (American Medical Association) recommends santonin, but states that many cases of poisoning have followed its use, and it should be given with caution.

Among opposite opinions by authorities we find Osler (Practice of Medicine) mentions only santonin in the treatment of ascariasis.

Both Kirk and Gray (eminent small animal practitioners of England) recommend santonin.

Charles E. de M. Sajous (author of Practical Medicine) says for the removal of lumbricoid worms nothing has been found to equal santonin and the dose is 1½ grains a day in broken doses. This dose is also recommended for a child one to six years old.

Shillinger (Journal of Agriculture Research) proves the low toxicity of santonin (he administered 10 grains to a dog weighing 14 pounds) but it is of opinion santonin has little value in removing round worms—a statement that has been disproved for the past hundred years. As will be shown in my experiments santonin is one of the most reliable agents we have for the destruction of round worms.

Friedberger & Frohner's Veterinary Pathology (Hayes) Page 251 recommends santonin as the best remedy for ascarids in small animals. In Frohner's Text-book of General Therapeutics for Veterinarians, the author states (page 177), that santonin is a specific against round worms. Muller and Glass especially mention santonin as the agent for treating dogs for round worms.

Hall (Department Circular 338) says santonin is effective in removing ascarids from dogs when it is properly given. It is usually safe and is especially valuable in the case of animals in which the digestive tract is inflamed. Again this same author in his booklet "Diagnosis and Treatment of Internal Parasites" gives the treatment of whipworms as follows: "For repeated doses a non-irritant drug, such as santonin, is distinctly indicated." Again he states that where there is inflammation of the digestive tract: "San-

tonin may be the drug of choice as it is not a gastro-intestinal irritant."

Brumley, page 205 in his book "Diseases of Small Domestic Animals" states: "Santonin is the most efficient agent used to remove the ascarids in dogs and cats."

Results of Experiments as to the Toxicity of Santonin

Experiment No. 1. Persian kitten, weight four pounds. Suffering from Sarcoptic mange. January, 5, 1929, the animal was given three grains of santonin in capsule. Close observation was kept of the animal following its administration and in no manner did it show any ill effect from the drug, never missing food given, temperature normal and from all appearance fecal material free from mucus and blood. On January 12th, 1929, the animal received five grains in capsule and nothing abnormal observed following its administration, excepting the animal did not partake of all food supplied at the evening feeding. Close observation for the next two weeks did not reveal a single abnormal condition. It will be noted that no cathartic was given following the administration of the santonin as it was my desire to obtain the full medicinal action of the drug and determine if possible without the aid of elimination of the drug by cathartics if there would be any harmful action from the santonin. The little animal remained well, as fat as a butter ball and no worse for receiving what may be considered from five to ten times the dose usually prescribed in practice.

Experiment No. 2. Aged female cat, weight estimated ten to twelve pounds. Has a slight vaginal discharge, probably a pyrometra. Appetite good and to all appearance normal excepting as above noted. January 6, 1929, the animal received 10 grains of santonin mixed in its food. Close observation for the next few days did not reveal a single abnormal condition, except the animal's bowels did not move until some time during the night between January 8th and 9th. The appetite remained good.

In order to test out the effect of administering santonin in repeated doses, this same animal received on January 16th, 17th, 18th, and 19th, five grains of santonin, mixed in a small amount of canned salmon and of which it partook greedily. No ill after effects followed the repeated and excessive doses administered. On January 25th, the animal was destroyed and a post-mortem held, and to macroscopic examination the intestinal tract was free from any inflammatory process.

Experiment No. 3. Mongrel male dog suffering from medium grade distemper, matured age and estimated weight of thirty pounds. On January 8, 1929, santonin, 15 grains, was administered in capsule and the same amount repeated on January 12th, 16th, and 20th, a total of sixty grains over a period of twelve days. No ill effects of the drug were noticed, although it will be noted the animal was suffering from distemper, from which it fully recovered and became to all appearance normal in every way.

Experiment No. 4. Mongrel foxhound of matured age and suffering from follicular mange. January 15, 1929, santonin 20 grains was administered in capsule and the same amount mixed in food on January 19, 1929. Nothing abnormal as a result of the santonin was noted in the animal's condition. January 23rd, 25 grains in capsule was administered to this dog and except for a medium grade nervousness and slight twitching of the monster muscles the animal appeared none the worse for the excessively large dose. The nervousness passed off in the course of a couple of hours and close observation for the next three days did not reveal any abnormal condition. On account of the incurable nature of the mange, the animal was destroyed on January 30, 1929, and not a single intestinal lesion could be found on autopsy.

Experiment No. 5. Mongrel German shepherd matured male dog, estimated weight, 70 pounds. January 15, 1929, 30 grains of santonin was given in capsule,

and on January 19th, and January 23rd, 20 was administered in the animal's food. To all appearance the animal remained normal, having never missed a feed.

Experiment No. 6. Same animal used as in experiment No. 5. The animal was starved for a period of 24 hours and February 3, 1929, received in capsule 30 grains of santonin at 2:30 p. m. Very close observation was made of the animal for the next few hours and the following conditions noted.

At 3:20 p. m., animal showed slight nervousness.

At 3:45 p. m., involuntary movement of the jaws and trembling of the front limbs.

At 4:00 p. m., animal unable to remain in a standing position.

At 4:15 p. m., a slight spasm occurred and others followed at infrequent intervals until 5:05 p. m. From this time on the animal gradually quieted down. At 10 p. m., was left for the night resting comfortably in its kennel.

Close observation at 8:00 a. m. February 4, 1929, did not reveal a single abnormal symptom. The bowels and kidneys had acted during the night. Food was offered at 9:00 a. m., but was refused. During the late afternoon the animal was offered one-half pound of fresh hamburger of which it partook. The animal remained well and today, (February 12, 1929), is as frisky as any normal dog could be.

Summary

From my experiments I am convinced:

1. That santonin is a safe agent to give to animals under all conditions.

2. That it is only when administered in excessively large doses will there be any toxic symptoms and even the effects of the relative large doses, the toxic symptoms, soon pass off, leaving the animal none the worse for the experience.

3. That in doses of five times that needed for therapeutic action, the drug is harmlesss to the patient and never causes any irritation of the gastro-intestinal tract.

4. That santonin is the drug best adapted of any that we have for use in small animal practice because of its easy administration in tablet or pill form, or it can be administered mixed in the food when prescribed as a home treatment.

5. That it never nauseates the patient as so often is the case when chenopodium is given.

6. That the treatment is excellent as a home treatment, as owners never complain that their pets were made sick by the remedy prescribed.

7. That the decisions in recent lawsuits behoove us to prescribe agents that are safe and not invite upon ourselves malpractice suits by giving some vermicide that has a kickback like chenopodium.

8. That the small animals practitioner's mission in life is to relieve morbid conditions without causing serious after effects (we can prevent bad after effects in treating our animals infested with round worms by using santonin) a thing I know is not possible when using chenopodium in dogs and cats.

The following series of experiments on a considerable number of dogs and cats and an endless number of records taken from my practice extending over a number of years show that santonin is as near 100% destructive to round worms as any agent we have at our command, and is without a single contra-indication even in the youngest and weakest of puppies and kittens. The lesser number of experiments and a few records of its use in practice, indicate clearly, I think, a hazard in the use of oil of chenopodium.

Santonin as a Vermifuge

In order to determine the end results of the different vermicides used in my small-animal practice I have for the past several years kept detailed clinical records of the cases treated and all cases diagnosed as suffering from intestinal parasites have been based upon a microscopical examination of the feces. It is not uncommon to have owners present

patients which are not harboring intestinal parasites, especially will we often hear a client remark after prescribing a vermicide to be used as a home treatment that his animal did not pass a single worm. Possibly there were none to be passed.

I am of the opinion that the percentage of the ordinary run of dogs and cats affected with intestinal parasites is much less than the figures often given by writers on the subject. Of course their figures may be based upon experimental animals which are in the greater number of instances bought out of dog pounds and from slum districts. Of course if we find one puppy or kitten of a litter suffering from intestinal parasites, it is reasonable to assume the greater part or possibly the entire litter, including the mother may be infested, but on the other hand it is not at all unusual to find entire litters of kittens and puppies free from intestinal parasites.

In all the case reports to follow in connection with this article, the diagnosis of intestinal parasites are based upon the following:

1. Finding the intestinal parasite in the fecal material, or

2. Microscopical examination of the fecal material and finding the eggs of intestinal parasites.

The following cases are only those found to be infested with Ascaris or Trichuris.

Case No. 1. Chow, weight 35 pounds, aged 20 months. Santonin, grains three, was given in combination with one grain of calomel and followed in three hours with one-half ounce of castor oil.

Results: Worms (ascaris) passed, 18. Fecal material examined 10 and 20 days after did not reveal a single parasite egg.

Case No. 2. (Hospital patient) Spitz, six months old, weight 15 pounds. Santonin, grains one, was given and followed twelve hours later with one grain of calomel. The first bowel movement contained three round worms (ascaris). Daily examination of the fecal material revealed numerous eggs, and santonin, grains one and one-half, was given and followed by castor oil, one-half ounce, some three or four hours after administering the santonin.

Results: The first bowel movement contained eight worms (ascaris). The second bowel movement contained four ascaris.

Beginning the following day five slides were prepared from each bowel movement daily with the following results:

Second day following the remedy an average of six eggs per slide found.

Third day following the remedy an average of three eggs per slide found.

Fourth day three eggs found in a total of five slides.

Fifth day no eggs found in a total of five slides.

Sixth day no eggs found in a total of five slides.

Four weeks later owner supplied fecal material from which microscopical examination was made and found free from eggs.

Case No. 3. (Hospital patient) Fox terrier puppy suffering from low grade distemper and round worms. Santonin, grains one, was given and followed with castor oil two drams.

Results: The animal passed, in a few hours, eight ascarids.

The following day examination of five slides revealed an average of fourteen eggs.

The following morning on account of the nature of the distemper the owner ordered the animal destroyed and on post-mortem examination not a single parasite could be found in the digestive tract, although smears made from the fecal material showed an average of five ascaris eggs per slide.

Case No. 4. Boston puppy, age two months. Santonin, grains one, was given and followed with three drams of castor oil.

Results: The first bowel movement contained twelve ascaris, and the second movement three ascaris. On the third

day slides were made of the fecal material with the following results.

Third day following treatment, an average of four eggs per slide were found.

Fourth day, an average of six eggs per slide were found.

Fifth day no eggs found.

Sixth day a total of four eggs were found in five slides.

One week later fecal material supplied by the owner did not reveal a single parasite egg. Three weeks later the animal returns to hospital as a boarder and for a period of three days bowel movements were checked and not a single egg found.

Case No. 5. Mongrel puppy, presented at the hospital with a history that the animal has had several spasms. Examination did not reveal any symptoms of distemper, except that the temperature was slightly elevated, 102.5° F. Microscopical examination of fecal material secured from thermometer revealed thirty-three ascaris eggs on a single slide. Santonin grains two, and castor oil, one ounce, was administered and the following results noted:

During the afternoon a total of 24 ascaris were passed in three bowel movements. The following four days slides were made daily as follows:

Second day following treatment an average of eight eggs per slide.

Third day an average of nine eggs per slide.

Fourth day an average of three eggs per slide.

Fifth day no eggs were found.

Two weeks later the patient was returned to the hospital for amputation of the tail and an examination of the fecal material did not reveal a single egg.

Case No. 6. Mongrel collie puppy, suffering from distemper (Office consultation). Examination also revealed ascaris eggs in the feces. Santonin, grains two, in addition one-half ounce of heavy mineral oil was administered.

One week later the owner returned with patient and reported that the animal passed a "great many" round worms following the administration of the remedy.

Fecal examinations were made later at frequent intervals as the patient was presented for distemper treatment but in no instance was a single ascaris egg found.

Three months following the treatment the patient was entered as a boarder for a period of three days and examination of fecal material did not reveal any eggs of the ascaris.

Case No. 7. Pure bred Boston, aged five months. Presented at the hospital for boarding and a history that she had been passing round worms. Microscopic examination of the feces revealed both ascaris and trichuris eggs. Santonin, grains three, was given followed in about four hours with one ounce of castor oil.

Results: The first bowel movement, nine ascaris and three whip worms. The second bowel movement, twelve ascaris and five whipworms. The third, two ascaris and no whipworms. The animal was given an intestinal lavage and three whipworms were washed out.

Daily fecal examinations were made for the next five days and each examination did not reveal a single ascaris egg, although whipworm eggs were present.

Treatment was now started to rid the intestinal tract of the whipworms and consisted of daily doses of one-half grain of santonin for a period of five days and followed with one ounce of castor oil.

Fecal examinations were made for the following few days and still found to contain whipworm eggs, an average of five eggs per slide for a series of five slides. A gastro-intestinal lavage was given the animal and the following day a series of five slides showed three eggs.

Santonin, three grains, was administered and followed the next day with a gastro-intestinal lavage. The following five days, five slides were examined each day and not a single whipworm egg found.

Examination of fecal material three months following the last treatment showed the animal to be free from whipworms.

Case No. 8. German Shepherd puppy six weeks old. The skin was very dry and considerable dandruff present. Slight itching shown by frequent scratching. Fecal examination revealed numerous ascaris eggs. Santonin, grains two, was administered and followed in three hours with one-half ounce of castor oil.

In about three hours the animal passed 19 large ascaris. In the next bowel movement not a single worm was found, but slides made from the material showed an average of twenty ascaris eggs for a series of five slides.

The animal was returned home and a request made that the owner submit samples of the bowel movement in one week, which he did and upon examination not a single egg was found.

This animal was afterwards treated as a home patient for distemper and fecal examination showed the animal free from intestinal parasites.

Case No. 9. German Shepherd puppy three months old, presented at the hospital with a history that during the day it had had several fits. While examining the animal it had a very severe fit which lasted several minutes. Luminal, grains two, was given, immediately to control the nervous symptoms. Fecal examination revealed numerous ascaris and santonin, grains two, was given followed in two hours with castor oil administered in capsules.

During the night the animal had several bowel movements which was examined (material being secured when kennel was cleaned), and a total of seventeen worms were found. The animal was taken home during the afternoon. Several weeks later I had occasion to examine this dog for a slight injury to one of the digits and at that time made a fecal examination and found the feces to be free from eggs of the ascaris.

Case No. 10. Huskie, male, aged seven months. Presented at the hospital with a history of not eating well for the past two days. It had a slight discharge of pus from the eyes and a temperture of 102.5° F. Examination of the fecal material revealed eggs of whipworms. A diagnosis of intestinal parasites and possibly distemper was made. Santonin, grains four, followed in three hours with one ounce of castor oil was dispensed.

The animal was returned on the fourth day for examination and found to have a normal temperature and the pus condition of eyes cleared up.

A series of five slides were made from fecal material and an average of three whipworm eggs found.

Santonin, grains one, in capsule was prescribed, one capsule every morning for five mornings, the last dose followed with a dose of castor oil.

Owner supplied me with fecal material on three different periods at intervals of one week and all proved to be free from eggs of whipworms.

Case No. 11. (Experimental) Mongrel spitz puppy, age three months, suffered from distemper and ascaris infestation. Santonin, grains two, was given and followed in three hours with one ounce of heavy mineral oil.

The first bowel movement contained sixteen ascaris, and the second contained two ascaris. The following day fecal examination revealed an average of nine ascaris eggs per slide in a series of five slides.

The animal was destroyed and a careful examination of the intestinal tract made, and not a single worm was found. Two slides made from the intestinal contents at the autopsy showed a few ascaris eggs. This experiment is interesting as it shows that an animal will continue to pass eggs for some few days even after the parasite has been removed.

Case No. 12. (Experimental) Angora kitten with a history of having vomited several worms and on three occasions having had fits. Fecal examination revealed ascaris eggs. Santonin, grains one, in capsule and a cathartic tablet containing aloin and podophyllum were given.

A bowel movement did not occur until during the night and when examined the

following morning was found to contain seven large ascaris. Daily fecal examinations for a period of five days did not reveal a single parasite. The animal was then given to friends and later returned to the hospital for removal of the ovaries. It remained in the hospital for a period of one week and several fecal examinations were made and not a single egg found.

Case No. 13. (Experimental) Collie (mongrel) puppy presented at the hospital with a history that it had been struck by an automobile the previous week, since which time it had been unable to use its hind legs (complete paralysis). The owner did not want to spend more money on the animal excepting the cost of destroying it. Permission was secured to use the animal for this experiment and then destroy it, as the previous history from the owner informed me that from time to time he had noticed the animal passing round worms. Fecal exmaination revealed ascaris eggs. Santonin, three grains, was administered and followed in three hours with castor oil.

The first bowel movement contained three ascaris, while the second contained eleven, a total of fourteen. As there had not been a real cathartic action from the dose of castor oil given I decided to give one dram of epsom salts in solution and from which was secured free catharisis. Examination the following day of fecal material did not reveal a single egg—the animal was then destroyed and posted and not a single worm found. Smears made from intestinal contents were free from eggs.

Case No. 14. (Experimental) Mongrel bred kitten found in the alley back of the hospital. Fecal examination showed it to be infested with ascaris. Santonin, grains ¾, was given, followed with a laxative tablet of aloin and podophyllum.

Eight adult parasites were passed. For the next several days daily fecal examinations were made and not a single egg found. The little animal has remained around the hospital for five weeks and fecal examination at the end of that period showed it to be free from intestinal parasites.

Case No. 15. Boston, male dog, aged one year old. Presented at the hospital suffering from a dry scaly skin ailment. Fecal examination revealed ascaris eggs in large numbers. The owner's statement is that he has noticed the animal's feces streaked with blood on several occasions. Santonin, grains three, was given and followed with one ounce of castor oil.

The first bowel movement occured four hours after giving the oil and the material was found to contain a large mass of round worms. It was impossible to count the exact number because the animal tramped around the kennel so much, but twenty-three perfect worms were separated from the fecal material which by no means represented all the worms passed.

The animal's bowels remained very loose during the day and material examined during the evening (ten hours after the vermicide treatment) did not reveal a single egg. The animal returned home the next morning and one week later a small amount of fecal material was brought in by the owner for an examination and found to be free from ascaris eggs.

Most veterinarians would hesitate to give a puppy in this condition oil of chenopodium. However, if necessary, it could be given santonin without harm

Case No. 16. Wired haired foxterrier puppy four months old; presented at the hospital with a history that it had been passing worms. Fecal examination revealed both ascaris and hookworm eggs. A history that the animal scratched a great deal, but no skin lesions noticeable.

Because fecal examination showed many more hookworm than ascaris eggs it was thought advisable to treat this case with carbon tetrachlorethylene of which 1cc. was administered, followed in one hour with a saline cathartic (epsom salts). The animal passed forty-six hookworms and four ascaris.

Three weeks later the patient was returned and entered as a hospital patient suffering from distemper. Fecal examination revealed both ascaris and hookworms still present.

On account of the distemper infection it is considered inadvisable to repeat the tetrachlorethylene, but santonin, grains two, were administered and followed with mineral oil with the result that eight ascaris were passed and two hookworms.

Fecal examination the following few days revealed hookworm eggs still present, but not a single ascaris egg. In due time the animal recovered from the distemper and it required two more treatments of the tetrachlorethylene to eliminate the hookworm infestation.

Case No. 17. Mongrel puppy, weight estimated at eight pounds. The animal was purchased from a dealer in pet animals because it was known to be infested with round worms. Santonin, grains two, was administered and followed in three hours with one-half ounce of castor oil.

It was found the following morning that the animal had had several bowel movements and several entire round worms were found. Because of the dried material and the fact that the animal had mussed up the material passed so badly it was impossible to fully determine the exact number of worms passed.

The animal was destroyed 22 hours after giving the santonin and a careful examination of the digestive tract made and not a single ascaris was found.

Case No. 18. White poodle puppy, bought from a pet shop, and known to be suffering from distemper and round worms. The little animal received one grain of santonin, followed with castor oil.

During the night there occurred four bowel movements which contained seven ascaris. An autopsy was held 48 hours after giving the santonin and not a single parasite found.

Case Reports and Experiments as to Toxicity of Oil of Chenopodium

As my use of oil of chenopodium in practice cases is confined to the few cases in which I used this agent several years ago I call the reader's attention to those numbered from 1 to 5 as cases treated during 1924.

Case No. 1. Pekingese male puppy four months old, one of a litter of three bred and raised by the writer. It was the prize puppy of the litter and I cared for it from birth to the time it was sold. I know at time of sale it was free from any intestinal parasites and free from any defect of hearing. Three weeks after I sold the puppy the owner visited my office with her puppy, saying the little animal had missed a couple of feeds. She had given it a prescription she had found in some dog book which was as follows:

Oil of Chenopodium, fifteen drops.

Castor oil, one-half ounce.

Directions: Give one teaspoonful every third day.

Although the medicine had been given but a short time before coming to my office, it was plain to be seen we had a very sick pup, vomiting and so weak it could not stand. Treatment consisted of small and often repeated doses of mineral oil and small doses of tinct. opii et Camphor and bismuth mixture. All symptoms pointed to a severe case of enteritis, the bowel movement for several days contained blood and mucous. The condition improved and the animal made a complete recovery from the enteritis in

the course of a couple weeks. While the puppy was in the hospital it was noticed that it could not hear—at least did not respond to voice and this fact was mentioned to the new owner, to which she replied that the puppy had always responded when called. The puppy was returned home and the deafness gradually cleared up after a few months.

Case No. 2. German Shepherd aged two years (imported). The owner requested worm medicine to be given at home and a mixture of oil of chenopodium fifteen drops in one ounce of castor oil was dispensed, with directions to starve the animal 24 hours and then administer the worm remedy. On the third day following administration the owner presented his animal at the hospital with the history that it could not see or hear. Turning the animal into the exercising yard the owner's diagnosis was easily confirmed. The animal was left with me for treatment, which consisted of a large dose of castor oil. In a few days the animal regained its eyesight but the deafness remained and until death from whelping, eight months after the administration of oil of chenopodium.

Case No. 3. Fox terrier puppy ten weeks old: This puppy was left at the hospital with a history that it had both vomited and passed round worms. Microscopical examination of the feces revealed eggs of the ascaris. Oil of chenopodium, five drops, in castor oil, one-half ounce, was administered. The puppy soon became nauseated and continued to vomit until it was deemed necessary to give a sedative. The following morning the animal was found in a semi-comotose state; bowel movement containing blood and mucous, and very tender throughout the abdomen; membranes highly congested, and a temperature of 104° F. On the third day following the administration of the chenopodium the owner called and seeing the deplorable condition the pa-

The opportunities are legion for parasitic infestation of dogs reared in large kennels

tient was in, ordered it destroyed. Post-mortem examination revealed a generalized case of gastro-enteritis extending as far back as the ileo-cecal valve.

Case No. 5. Three Persian kittens eight weeks old, were presented by the owner with a history that she had administered to each a dose of a proprietary liquid vermicide. She reported that soon after giving them the medicine the animals began to vomit and refused all food. The worm remedy had been given the day before they were presented at the hospital. She brought along the bottle of the vermicide; the odor of which was characteristic of chenopodium. Death soon relieved the suffering of the little animals and post-mortem examination revealed a generalized enteritis.

Experimental Case No. 6. Matured female cat weighed six pounds. Microscopical examination of the feces did not reveal any ova of any intestinal parasite. Chenopodium, drops four, in two drams of castor oil was administered at 11 a. m. January 8, 1929. Within one-half hour the animal appeared nauseated and was slobbering. At 3 p. m. the animal had vomited several times and refused the evening meal. The animal refused food until January 14th, and then ate very sparingly. The bowel movements were bloody and contained considerable mucous. From this date on to January 26th, the animal's appetite remained very poor; the bowels irregular and more or less mucous and blood was present and the animal was losing flesh (estimated weight on January 26th, when the animal was destroyed is three pounds). An autopsy revealed an extensive, but disappearing inflammation of the cardiac portion of the stomach and a considerable degree of inflammation in the illeum. The pancreas was found enlarged and hardened, whether this condition was the result of the action of chenopodium, I am unable to say.

Experimental Case No. 7. A half grown alley cat. Fecal examination revealed the presence of no intestinal parasites. It appeared to be in good normal health, excepting for a slight non-parasitic ear canker. Oil of chenopodium, four drops, and castor oil, one dram, was administered on January 19, 1929. The animal soon became nauseated and vomited several times within the next hour. The following day the bowel movement contained a small amount of blood and mucous, the animal refused all food and continued to slobber, having a woebegone appearance and remained in a humped-up position in the kennel. On the fourth day the animal ate a small amount of canned salmon. The appetite gradually returned to a limited degree. It continued to lose flesh until at the end of two weeks it was little more than a walking skeleton. The animal had been kept in the hospital until this date (February 25th), when it appeared to have regained its former condition of good health.

Experimental Case No. 8. A matured mongrel dog weighing 45 pounds was given oil of chenopodium, 30 drops, in two ounces of castor oil. The animal was soon nauseated and vomited several times during the next few hours following administration of the remedy. The animal refused all food for two days and gradually returned to full food and appearance. No blood or mucous noticed in any of the bowel movements following the administration of the mixture.

Experimental Case No. 9. A mongrel shepherd puppy, estimated weight, 25 pounds, was given 1cc. of oil of chenopodium in one ounce of castor oil. In a very short time the animal was nauseated and vomited several times. Refused food for a period of two days. The appetite gradually returned to a limited degree. On the sixth day a bloody diarrhea supervened. Large doses of kaolin and bismuth were administered three times daily to which the animal responded. Only after a period of three weeks did I consider the animal's condition again normal.

FEED WILL NOT CONTROL INFECTIOUS ABORTION IN COWS

The five-year study undertaken at the Wisconsin Experiment Station to determine the influence of nutrition on the ability of a cow to resist contagious abortion is now in the fourth year, and while the experiment is yet incomplete, a number of significant findings have developed.

Forty heifers were selected for the experiment as abortion free on the basis

A cow that lactated continuously for 11 years following her last calving.

of a negative reaction to the agglutination test. All heifers dropped normal calves in the spring of 1928 and there were no cases of abortion or udder trouble, thus indicating that it is entirely possible to establish a disease free herd and keep it clean by buying young abortion free foundation stock and keeping the animals away from other cattle.

An unexpected discovery in this experiment was that the butter fat content of milk is depressed more than 20% by feeding cod liver oil to the cow. However beneficial cod liver oil may be for other species of farm animals, it is absolutely harmful to milking cows.

Hadley, who has charge of the experiment, concludes: "There is at present no indication that feed will control contagious abortion or that resistance to this disease can be increased by building up the mineral or other nutritional reserves of the animal."

Sugar beet tops constitute a relatively valuable byproduct because of their food value for live stock. The tops may be fed direct from the field. However, they are usually either dried and fed as hay or stored in a silo and fed as ensilage. Beet top silage has approximately one half the food value of corn silage, and beet top hay has about the same value as alfalfa hay.—Minn. Spec. Bul. No. 129.

The control of liver flukes in sheep depends upon the systematic administration of carbon tetrachlorid in 1cc doses, or the eradication of the intermediate host, the snail, by the application of 270 pounds of copper sulphate one part and land plaster eight parts per acre. The frequency of application of this mixture will depend upon the character and drainage of the soil.—Bul. 266 Oregon.

In the State of Michigan, it is estimated that 20% of all the commercial hatchery chicks sold die of pullorum disease, involving a loss of $390,000. Approximately 6% of the hens are afflicted with avian tuberculosis, involving a further loss of $960,000, and that coccidiosis, typhoid, cholera, blackhead and parasites cause annual losses of at least $1,000,000. The total annual loss to the poultry industry in Michigan from these diseases would, therefore, amount to $2,350,000.

DISPOSAL OF DEAD ANIMALS

The complete destruction or sanitary disposal of animals that die of disease or from unknown causes is strongly urged as a means of controlling diseases. Incineration is the preferred method, but when this cannot be done, deep burial is a second choice. Additional precautions are necessary in dealing with certain diseases. Leaving dead animals on the surface of the ground or feeding them to other live stock is a menace to healthy stock and to the general welfare.—U. S. Dept. of Agric. Miscellaneous Publication No. 81.

THE TRANSITION OF "CUTS"

The character of "cuts" in horses have materially changed in the past few years, as the accompanying pictures show. Such injuries nowadays are not so often caused by an old rusty barb-wire, but some sharp bladed implement, such as the blade of a disc harrow, the share of a plow or the shovel of a cultivator. Cuts from sharp blades are usually deeper; but being more clean cut, they do not offer the resistance to treatment that the old barb-wire cut did.

The causes of this transition are many and perhaps in line with other forms of

Injuries from kicks we still have and they are stubborn wounds to treat, but because we have better antiseptics than formerly, we do not dread them as we once did.

progress. Old zig-zag wire fences have been replaced by straight line fences. More and more woven wire fences are replacing barb-wire fences. Steel gates are replacing the old "two barb-wire" gates. All of these improvements have lessened the number of wire scars in horses. Horses see a steel gate more readily than a wire gate and thus many injuries are avoided.

The decrease in the number of horses found on the farm today as compared with that of a few years ago must also contribute to this decrease of wounds. Fences enclosing pastures and farm lots today are so constructed and placed that they are less of a hazard to live stock.

Most of the cuts that we are called upon to treat today are not those with large, ragged edges, but deep, clean cut wounds. The wire cuts of the past were generally sustained while a number of horses were running along a fence with one of the group being crowded into it. This caused wounds such as is shown in Nos. 1 and 2 on the opposite page.

Sometimes it was necessary to suture these wounds and in other instances they would heal more rapidly by treating them as an open wound. The drainage and amount of laceration generally determined whether or not it was best to close a wound. No. 1 was treated as an open wound; No. 2 was sutured and drained, and both did nicely.

Nos. 3 and 4 are examples of wounds where suturing was either harmful or imposible. This type of a cut was commonly received from kicking over a barb wire. The one shown in No. 3 finally healed, but left the animal with a badly deformed foot. No. 4 is a wire cut in which the extensor tendon was completely severed and the metetarsal bone badly shattered by the barbs. The animal was killed immediately to end its misery.

Nos. 5 and 6 represent a later type of cuts, such as are received from walking or backing into some sharp bladed implement. In No. 5 the wound had just been bandaged when the photograph was taken, but No. 6 (the same case) shows the scar very well. This cut was produced by the animal lagging behind at turn in the field while hitched to a disc harrow.

No. 7 is another disc wound and shows both flexor tendons severed. This cut resulted from the animal suddenly stepping back, at the approach of a small bridge, and the disc running forward onto him. The animal was destroyed at once, as treatment was considered hopeless.

In comparing the various views one will

readily see that wounds of today are usually more clean cut than those of the past. Barb-wire cuts are comparatively seldom heard of and a large amount of credit for this must be given to the better grade of woven wire fences of today. They are, in most instances, of sufficient height that the lower wires of the barb-wire fence have been replaced by the woven wire. Sometimes an animal will get tangled up in a woven wire fence and do considerable damage, but woven wire seldom produces the ragged condition and lacerations that barb-wire is almost certain to do.

Repair in a wound is more rapid when a clean cut smooth surface is brought together by suturing than in that with much laceration.

There are many other types of wounds which one is called to treat, and in presenting these my intention is to show, in a small way, the change in type that I have noticed of late.

W. P. Bossenberger.

Williams, Iowa.

Tuberculosis Eradication

Extent of Bovine Tuberculosis

A survey showing the extent of bovine tuberculosis has been made every two years since 1922. This work is conducted on a county basis in cooperation with the livestock sanitary officials of the respective States, and the incidence of bovine tuberculosis reported in each county is based on information available to the state and federal authorities in charge of the work. The latest survey was completed in 1930. The

The progress that has been made in tuberculosis eradication would have been impossible without the intradermal test, which was popularized and used in the Missouri Valley country for several years before it became official.

following table gives the general estimates for all of the surveys made thus far:

Year	*Percent of Tuberculosis*
1922	4.0
1924	3.3
1926	2.8
1928	2.0
1930	1.7

In 2,721 out of a total of 3,072 counties in the United States, the degree of tuberculosis infection in cattle does not exceed 1% and 946 counties or nearly one-third of the total number of counties, are modified accredited areas, the percentage of infection in which is less than 0.5%.

Two years ago the number of accredited counties was only 499. Eighty-three per cent of all the cattle in the United States are in the area where bovine tuberculosis does not exceed 1%. In the more heavily infected areas, where the degree of infection exceeds 7%, there are only 121 counties and these counties contain but 5.2% of the cattle population of the whole country.

Additional States Begin Tuberculosis Eradication

During 1930, Nevada, Oklahoma and Texas were added to the list of states containing modified accredited counties; that is, counties in which the prevalence of tuberculosis in cattle has been shown by actual test to be less than 0.5%.

More Milk from Fewer Cows

The elimination of the spread of tuberculosis among milk cows has placed the dairy industry on a more healthy and profitable basis. There are now 1,074,000 fewer cows in the whole country than there were 12 years ago. Nevertheless, we are able to provide dairy products for 18,000,000 people more than in 1917, notwithstanding the consumption of milk has been increased more than 30%.—*Nebraska Star.*

Tuberculosis in Hogs Reduced

There were 20% fewer hogs condemned for tuberculosis last year than was the case during the previous year. Only 40% of as many infected carcasses in hogs was found on slaughter at Chicago in 1929 as were found in 1924.

Government records show that the losses on carcasses of hogs and parts of carcasses condemned on postmortem inspection for tuberculosis are now only 3c per hundred weight of hogs slaughtered. In 1924, the loss was 10c per hundred weight.

Tuberculosis in a Goat

It is rare that goats are found to be affected with tuberculosis at slaughter. However, one such was reported recently by the Meat Inspection Division of the Bureau of Animal Industry. The case was an extensive, generalized one. The goat was from a farm where the entire herd of cattle, 34 in number, reacted to the test. It had been allowed to run about the stables and mangers at all times.

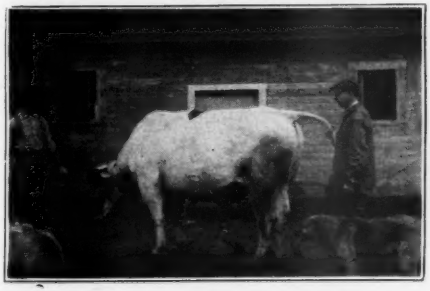
New Avian Tuberculosis Regulations

Texas and Alabama have promulgated regulations for preventing the shipment of chickens affected with tuberculosis into their territory. Other states contemplate the enactment of such regulations in the near future.

Funds for Avian Tuberculosis Eradication

The following resolution was passed by The Poultry Sanitation Commission on January 22, 1930:

"Resolved: That because of the widespread and increasing prevalence of tuberculosis in poultry, which is seriously injuring this important industry, we urge the Congress of the United States to insert in the Agricultural Appropriation Bill now pending an item of $50,000 for the use of the Bureau of Animal Industry of the U. S. Department of Agriculture for the specific purpose of combating tuberculosis in poultry."



A well marked intradermal reaction in a bull. On postmortem examination, extensive caseocalcareous lesions were found in the post-pharyngeal glands, which were of the size of a base ball. The thickness of the caudal fold could be observed easily at a distance of 100 feet.

Tuberculosis Rate in Infants and the Milk Supply

The *Journal of the Amer. Med. Association* states that 100 children of approximately the same social status in adjacent towns were tested by Withington with 1:1,000 tuberculin introduced intradermally. Conditions in the two towns were approximately the same except that 47% of the children of one town had unboiled or unpasturized milk as against 6% from a second town, and that all of the raw milk of the latter group was from tuberculin-tested herds, whereas none of

Goats are rarely affected with tuberculosis. It is fortunate since in this country their milk is used almost exclusively as unpasteurized fluid milk and is consumed chiefly by infants and invalids

that of the former group was. The incidence of reactors in the first group was 7 times that in the second group. In the first group all of the seven positive and all but two (possibly three) of the twelve doubtful cases fell in the group of 47% who had a history of having drunk raw milk. In the second group, in two of the four doubtful cases there was a definite history of exposure to tuberculosis. Of the remaining doubtful cases, one belonged in the group of 6% who had drunk raw cow's milk.

When Therapogen soap is used in bathing dogs, it will not only rid them of fleas and lice, but the familiar objectionable odor of the wet animal will be practically eliminated.—Theo. Meyer.

ABORTUS INFECTION OR "CHAPPING"

I wish to ask you a question and would like to have it discussed in VETERINARY MEDICINE soon.

I have a fairly large cattle practice along with my other work, and when cold and windy weather starts, I have quite a bit of trouble with an erythema or eruption on my hands and arms. This condition, I think, comes from working in water and disinfectants.

I should like to know of some good protective application that I could use on my skin to prevent this condition.—G. T. S., Pennsylvania.

Reply: To be consistent in such a matter, a veterinarian should see his physician. To attempt to be his own doctor subjects the veterinarian to the same risks of a faulty diagnosis and ill-advised treatment that he sees every day as a result of his client's mistakes when acting as their own veterinarian.

In this condition, however, it may be pointed out that it was a veterinary bacteriologist (Huddleston) who discovered that many veterinarians who do cattle practice suffer from a condition similar to that described by G. T. S., from the effect of Brucella abortus organisms on the skin of the arms (VETERINARY MEDICINE, Vol. 25, No. 9, September, 1930, page 397). If a review of the enquirer's experience should show that these attacks followed closely after sterility and obstetric operations, it would raise a presumption that the affection may be due to the effects of abortus organisms aided and abetted by the effects of cold. Cold, in combination with soap and water, has a tendency, as everyone knows, to cause "chapped" hands in many individuals. The cause of chapped hands in persons of ordinary occupation would, in a veterinarian, for obvious reasons, operate to cause chapped arms also.

On the subject of the cause and treatment of chapped hands, the "Handbook of Therapy," an official publication of the American Medical Association, says in part:

"The chief reason for chapping of the hands is the lack of fat in the skin in cold weather. Fat production in the skin is at a minimum in cold weather, because of the diminished sebaceous and sweat secretion. This and the dry air of winter make the skin dry and vulnerable at the very time when the cold air itself is irritating. This combination leads readily to chapping if the hands must be exposed much to soap and water, and particularly if the irritation of antiseptics is added, as in the case of physicians and nurses.

"The first thing to do to prevent or overcome the condition is to supply, by greasing the skin occasionally, the lacking fat in the skin. Almost any bland fat or semisolid hydrocarbon will do for this purpose, but nothing is better than a well made cold cream. The next and more difficult thing to do is to avoid soap and water—especially soap—as much as possible; and it is here that hand lotions serve a very useful purpose.

"Hand lotions are generally of two types: (1) glycerin; solutions of the glycerin, rose water and benzoin kind, and (2) gelatinous liquids made with tragacanth, quince seed, or some other water-soluble colloid. The glycerin lotions work well with some skins and are the most satisfactory to an occasional individual; but as a rule they are not the best, first, because the glycerin tends to make drier a skin already too dry, and second, because these lotions have little or no detergent effect and do not clean the skin.

"The tragacanth and quince-seed lotions are better, and of these the tragacanth lotions are certainly as good as any other and are very cheap and easy to make. A formula for such a lotion given by Pusey is as follows:

℞	Tragacanth	ʒ l
	Glycerin	ʒ ii
	Boric Acid	ʒ iii
	Water	O i
	Oil of Bergamot	gr. x.

M.

"The oil mentioned being added as a perfume might be omitted, according to the wish of the prescriber.

"The boric acid, glycerin and water are

first mixed, the tragacanth added and the mixture agitated until the tragacanth is dissolved. This makes a rather thick mucilage; it can be changed to any consistency desired by slight increase or decrease in the amount of tragacanth.

"A lotion like this has a considerable detergent effect; it is a fair substitute for soap, and if it is freely rubbed over the hands and wiped off, either with or without the use of water, cleans the skin of all but the most tenacious dirt. It, of course, cannot be effectually used as a complete substitute for soap. Such a lotion has the advantage over soap that it not only is not irritating to sensitive skin, but also is bland and soothing. It thus tends to prevent and eventually to cure chapping of the hands."

EFFECTIVE WHIPWORM TREATMENT IN DOGS

Until recently I was of the opinion as expressed by Horning and McKee in the August, 1930, issue of VETERINARY MEDICINE (Page 337), that "practically all anthelmintics fail in the treatment of whipworm infestation in dogs."

I tried for seven years to rid a small terrier of this parasite, giving toxic doses of all the various anthelmintics without success until a few months ago.

Concerning the effect on the host, my experience has been at variance with that of Doctors Horning and McKee. I have observed many chronic and some acute conditions, both local and general that were caused by this parasite. While the so-called "fright disease" has a great variety of causes, I am sure whipworm is responsible for many such cases. I have found that whipworm is invariably present in ulcerative cecitis.

In those cases of violent colic in dogs where there is no apparent cause and in which even enormous doses of morphin as well as chloral and the synthetic analygesics and hypnotics fail to give relief, ulcerative cecitis accompanied by the presence of whipworms will invariably be found.

Some recommend the removal of the cecum for this condition. I have found this to give relief in some cases, but owing to the necessity, in order to remove all diseased tissue, of cutting so close to the ileo-cecal valve as to cause cicatricid stenosis I am not so enthusiastic about this operation. In about 30 days, these cases show such stenosis that food fails to pass the ileo-cecal valve. However, too much weight in appraising its worth should not be attached to my very limited experience, with this operation.

It has been recommended that cecectomy be performed in normal dogs showing this form of parasitic infestation if the worms cannot be removed by drugs.

My method of attack upon these cecal and rectal worms is that of injecting oil of chenopodium in parafin oil into or near the mouth of the cecum via the rectum using a turkey gizzard catheter or a metal syringe with a heavy nine-inch dose pipe. In large dogs, the turkey catheter is the better.

The precaution necessary is to use a blunt instrument, and not force the pipe ahead if resistance is encountered. The best time for the treatment is the first thing in the morning, just after defecation. No starvation is necessary and one treatment will kill *all* worms.

Weekly fecal examinations (microscopic) should be made to be sure that reinfestation has not taken place. In only a single case have I found the second dose necessary.

Giving oil of chenopodium *per os* is often attended with toxic effects, but I have not found this to be the case following the rectal injection of the drug.

The dose I use is one drop of oil of chenopodium to the pound weight of dog. For a 15 pound dog, I use

℞ 01. Chenopodii.....gtt. XV
01. Paraffini .....℥ I

Misce. Sig. To be injected at once into rectum as a high enema.

F. G. Steinbach.
Wildwood Crest, N. J.

THE VALUE OF POSTMORTEM EXAMINATIONS

On page 454 of VETERINARY MEDICINE for November 1930, is an interesting discussion indeed, under the title "Lubricating Oil as a Laxative."

In addition to teaching one something, an autopsy frequently protects one's reputation and thus pays double.

A postmortem examination would have cleared up all supposition and definitely placed the lubricating oil in its class and have ended further discussion.

I always learn something from an autopsy and am willing to make them without charge.

From H. B. F.'s report of the case: Temperature, pulse, respiration, time following parturition and the result, it appears to me that malignant edema was the dominating malady.

Only last week, I treated a case of enterostaxis, which improved. Medicine was left for the patient. A week later the patient died. The postmortem findings revealed pneumonia due to administering the medicine carelessly. This is just another illustration of the importance of holding an autopsy on all cases that terminate fatally.

My policy in all cases that die is to hold a postmortem examination free of charge. I urgently request permission to do this. It pays double. I learn something every time and it protects my reputation in not a few instances.

Twin Falls, Idaho. W. A. Faloon.

CONDENSED STATEMENT OF AIMS OF B. A. I.

Stated very briefly, the Bureau of Animal Industry is working for the following results:

A better quality of live stock.

Improved methods of live stock feeding.

Suppression of animal diseases and parasites.

A higher standard of live stock sanitation.

Reduced mortality of young animals.

Humane treatment of live stock.

High standard of veterinary education.

Useful discoveries through research and experimentation.

Information on current conditions in live stock production.

Use of meat-inspection records in determining live stock health.

Cooperation among the various branches of the industry.

Enforcement of laws and regulations.

Exclusion of foreign live stock diseases, pests, and viruses.

Assistance to the industry through investigations and education.

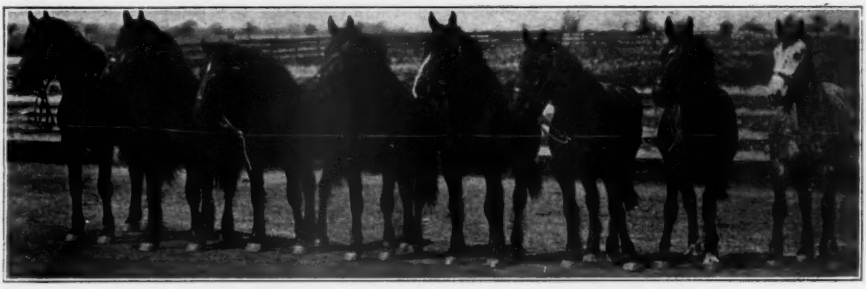
Effective supervision of public live stock markets to insure fair dealing and public confidence.—U. S. Dept. of Agric. Miscellaneous Publication No. 81.

LET'S GO!

The International Live Stock Exposition, supreme as for three decades past in its field, opens its gates at the Chicago Stock Yards November 29th. Its awards have made world-wide reputations for many a fortunate exhibitor and will continue to be the most-sought honors of the year in those great branches of live stock husbandry which deal with draft horse production and the conversion of farm products into beef, pork and lamb. Breeders whose aim is national recognition know that the goal is most surely reached through its championships.

From the very hour of its conception this event has been the magnet that has attracted the steadfast support of the master minds engaged in the propagation of meat-making animals. It has never been and never will be sectional or local in its sphere of influence. Its appeal is to all America and to our good neighbors of the north. It has become a continental clearing house where men engaged in a common cause annually foregather, match the creations of their art, exchange ideas and experiences and plan future progress. In times of prosperity an overwhelming triumph; in adversity, supporting morale and confirming our faith in the permanence and certain perpetuity of the industry it promotes.—Samuel R. Guard in the *Breeder's Gazette*.

Breeders whose aim is national and international recognition know the goal is most surely reached through Chicago championships.



In times of adversity the International confirms our faith.

Chick Pneumonia

By B. A. BEACH, Madison, Wisconsin
Department of Veterinary Science, University of Wisconsin

OUTBREAKS of so-called brooder pneumonia are of frequent occurrence during the hatching season. The Veterinary Science Laboratory received 2,537 chicks of all ages during the months of March, April, May, and June. Three hundred and eight, or approximately 20% of this total were diagnosed brooder pneumonia. The economic importance of this disease is therefore considerable.

The predominant gross changes are congestion and abscess formation of the lungs. There is considerable difference of opinion as to the cause or causes of these lung lesions.

In an effort to learn more of the bacteriology of these conditions, 355 chicks sent to the laboratory were investigated. Both the liver and lungs were cultured. They fell into three groups depending on the lesions shown. Those with abscessed lungs, those showing congested lungs, and those chickens which came to the laboratory in lots, some of which revealed either abscessation, congestion, or both, but that were apparently normal. The results are set forth in Table I.

As will be seen from the table, 71% of the chicks with congested lungs failed to reveal pullorum as compared to 47% of the abscessed lung chicks and 79% of the apparently normal.

Eight per cent more of the congested lung chicks revealed pullorum than did the normals, and 39% more of abscessed lung chicks revealed pullorum than the normals. Fifty-three per cent of the chicks with abscessed lungs revealed pullorum, as compared with 29% of those with congested

TABLE I.

Pullorum in neither lungs nor liver		Pullorum in both lungs and liver		Pullorum in liver only		Pullorum in lungs only		No. of chicks showing pullorum	Total number of chicks
No.	Percent	No.	Percent	No.	Percent	No.	Percent		
CONGESTED LUNGS									
123	71+	14	8+	19	11	16	9+	49	172
ABSCESSED LUNGS									
39	47+	12	14+	20	24+	11	13+	43	82
APPARENTLY NORMAL LUNGS									
80	79+	8	7.9	7	6+	6	5+	21	101

TABLE II.

Cultures used	No. of Chicks	Age of Chicks	Mortality up to 3 weeks	Organism found	Percent of mortality	Total Pullorum mortality	Total Coli mortality	Total control mortality
Salmonella Pullora	26	7 days	17	Pullorum in 13	65%+			
Salmonella Pullora	11	5 days	1	Not cul.	9%+			
Escherichia coli	18	7 days	7	Col in 6	38%+			
Controls	25	7 days	5	Nothing specific	20%+			
Controls	13	5 days	2	Nothing specific	15%+			
Salmonella Pullora	23	1 day	1	Not cul.	4%+			
Controls	58	1 day	14	Coli in 2 Pull. in 2	24%+			
Escherichia coli	38	1 day	12	Coli in 8; Pull in 1	31%+			
						26%	34%+	19%+

lungs, and 21% of the normals. The differences in percentage between the lungs and liver is so small as to be of little significance.

Artificially Exposed Chicks

Doyle and Mathens[1] exposed chicks to alfalfa dust mixed with pullorum and report that 75 per cent of the chicks thus exposed developed typical lung lesions.

In order to determine the effect of various organisms on young chicks, the following experiment was carried out:

The white diarrhea and the ordinary colon organisms were used. The cultures were grown in ordinary agar and washed off in salt sol. Both the experimentally infected chicks and the controls were placed in tight boxes and sprayed until thoroughly wet, in the first case with the culture and the controls with sterile water. The results are set forth in Table II.

Perusal of the above table reveals a mortality of 34 per cent and 26 per cent as a result of spraying chicks with a colon and white diarrhea culture. The 15 per cent mortality of the controls, however, was surprisingly high.

Discussion

That the white diarrhea organism is frequently associated with lung involvements in chicks is evident from the results shown in Table I. Out of a total of 355 chicks, pullorum organisms were demonstrated in 113 of them.

In the experimentally infected groups there was little difference in mortality between the pullorum and colon infected chicks. The mortality, however, in the control chicks was so high that the infected group is probably not very significant. Are infections the primary cause of chick pneumonia, as it occurs in the field? Is some debilitating factor necessary before the organisms can make headway? These are questions that must be answered before the problem can be solved.

The experimental work herein reported is not comprehensive enough to be conclusive. It is planned to pursue the work on a larger scale.

[1] Doyle W. P. Mathens F. P. Bull. 323, Purdue Agr. Exp. Sta.

VETERINARIANS NOT ANXIOUS FOR SALARIED POSITIONS

Only 65 veterinarians in the whole country presented themselves for examination on the occasion of the latest civil service examination for applicants for appointment to the position of Veterinary Inspector in the Bureau of Animal Industry of the U. S. Department of Agriculture.

Of this number, 52 successfully passed the examination. On the same day that the veterinary examination was held, an examination was held for Lay Inspector (meat) for which 4,734 presented themselves in the various cities throughout the United States. Since the initial pay for a Veterinary Inspector is $2,000 a year and for a Lay Inspector $1,620 a year, it appears the present business depression is not driving veterinarians to seek salaried positions to the extent that it is some other groups.

In the civil service examination for Veterinary Inspector held last June, 51 were examined of whom 32 were certified as qualified for the position. More than half of that group have already been appointed and now employed in the B. A. I.

The pay of veterinarians in the Bureau ranges from $2,000 to $9,000 a year.

ASCITES IN A DOG

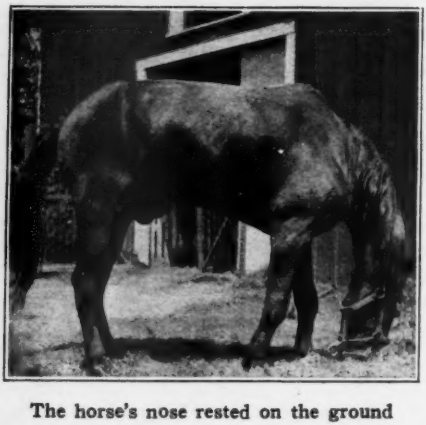
At the clinic of the University of Pennsylvania, a case of ascites in a chow was presented recently in which the peritoneal cavity contained 14 liters of ascitic fluid, weighing 29½ pounds. The dog measured 38 inches from the tip of the chin to the tip of the tail, and 39 inches round the abdomen.

Treatment was considered hopeless and the animal was destroyed. The carcass weighed 27½ pounds after the removal of the ascitic fluid. No cause for the condition was found on autopsy other than cirrhosis of the liver, a very common condition in aged dogs, but uncommon in dogs as young as this one—14 months. The case was reported in the *U. of P. Bulletin.*

CERVICAL PARALYSIS IN A HORSE

I was called the morning of July 25th to see a grey gelding about 14 years old and weighing about 1400 pounds. The owner had found him in the pasture lying down the preceding evening. When led home, he acted a little stiff. On the morning I saw him he showed no stiffness; was standing quietly, droopy, ears hanging, breathing slightly abnormal, but not bad. The pupils were dilated and the eyes had a queer staring expression. The temperature was about 99 deg. F., being difficult to record because of relaxation of the sphincter ani. The skin was dry, but neither hot nor cold; pulse 60 to 65 and somewhat uneven. Auscultation over the heart detected a metalic pounding sound. Peristalsis was somewhat exaggerated and occasionally a small amount of mushy feces was passed, indicative of catarrhal enteritis. The urine was normal in color. This animal had no appetite, but drank a small amount of water when taken to the trough.

This horse had been in good health previously, was in good condition and had a glossy coat of hair. He was kept in a timber



The horse's nose rested on the ground

pasture where there was plenty of grass and got no grain. We suspected he must have eaten some kind of poisonous plant. However, they knew of no such plant in this pasture.

My treatment for the horse at this time was an aloin cathartic followed by a pint of raw linseed oil twice in twenty-four hours. Also every four hours two drams of fluid extract nux vomica and one dram of a guaiacol mixture in dilution. I left telling the owner that the horse was sicker than he appeared to him, but that a change for the better might occur. I told him to call me the next morning or sooner if necessary.

The following morning this client called me and stated he believed in some ways the horse was a little better, but he could not hold up his head. I told him I felt the horse must be much worse and that no doubt was why he did not feel like holding up his head. This horse was not an extremely valuable one and the distance was ten miles away, so I did not urge a call too strongly. I said that I believe he could not be saved if he had got much worse, but if he desired me to come I would.

When I got to the farm, the horse was lying stretched out upon the ground. His temperature was about 98 deg. F. Pulse 60. The heart was pounding and the respiration was slow and steady. He was sweating a little and seemed to be suffering in a manner commonly noticed in milk fever in cows when they can still lie up on the sternum. The senses of the horse seemed normal. I was not there long when the horse rolled over on his sternum and got up in a normal manner, but after he was up I beheld the most peculiar position I ever saw or read about. The horse could walk fairly well, but were it not for the support of the ligamentum nuchae his nose would have been dragging on the ground. All the cervical muscles were as flabby as so much muscle would be were it cut away from the body. I took considerable pains to find that it was not possible for this horse to raise his nose off the ground when standing. The masseter muscles were not noticeably affected. None of the cervical muscles nor the skin thereon would react any to the prick of a pin. The muscles of the front legs and from there on back did not seem to be affected.

At this time it seemed impossible for the horse to eat or drink. To all appearances

he never would eat or drink again. The owner said the paralysis had been getting worse right along. The horse would lie down flat on his side most of the time, for it seemed that was the only way he could get any rest for his head. When he stood a little while the membranes of his mouth would become very cyanotic, due to the pendulent position of the head. The cyanosis would disappear when his head was lifted by an attendant.

I told the owner I thought it was about the most hopeless case I had ever seen; explaining that the nervous system controlling those muscles was affected. It was becoming worse fast and I did not know of anything that would help him; however, I might try an intravenous injection of a product that does help in some paralyzed conditions, but might do no good here. At least I felt it could do no harm.

This horse had a subnormal temperature and a paralysis even if only partial. This brought to my mind the idea of milk fever in cows and the sort of reaction we get when calcium is injected into the blood stream. I thought it advisable to try a calcium chlorid injection. It could do this horse no harm, the case seemed absolutely hopeless, and if it helped one kind of paralysis possibly it might be beneficial in this.

I therefore filled a 40cc syringe with a 20 per cent solution of calcium chlorid and injected it slowly into the jugular vein. Before I got through injecting the first 40cc the horse raised his head one foot from the ground and in less than two minutes began to eat grass. He also went to the trough and lifted his head 18 inches high and drank water. The results of the first injection seemed so magical to me and the owner and his son that we were dumbfounded. I injected another 40cc of Calci-Chlor to make sure he had all his system needed. There was no noticeable, sudden reaction following the second injection. I now took the temperature of this horse that only ten minutes before had been 98 deg. F., and found it 101 deg. F., or practically normal.

This horse's cervical muscles improved from the moment of the injection and continued to improve until in about four days he was entirely normal. Fluid extract nux vomica and a guaiacol mixture were given throughout convalescense.

To me this case is most unusual in more ways than one. First, no one will ever know exactly what kind of a poisonous plant, if any, this horse ate. Secondly, why were only the cervical muscles so completely paralyzed when the rest of the muscles of the body were apparently normal and no noticeable injury in the cervical region that could cause this paralysis? Thirdly, why did this paralysis react so magically and so favorably to a 20 per cent solution of calcium chlorid? These are questions I cannot answer.

West Point, Iowa. S. P. Holtz.

Hart and others were unable to increase the normal copper content of milk (about 0.15 mg. per liter) by the addition of copper to the ration. The copper content of milk of cows in different sections of the country varies, but the variations are so slight as to be considered of no significance.

Four cases of trichinosis in the human in California had their origin in bear meat, and two cases in Germany were traced to the same source. The transmissible diseases

Four cases of trichinosis had their origin in bear meat.

of game, such as tuleremia and trichinosis and tapeworms from fish, are taking the joy out of the sportman's life.

VETERINARY MEDICINE

Vol. 25 January to December 1930

Published by VETERINARY MAGAZINE CORPORATION
Chicago

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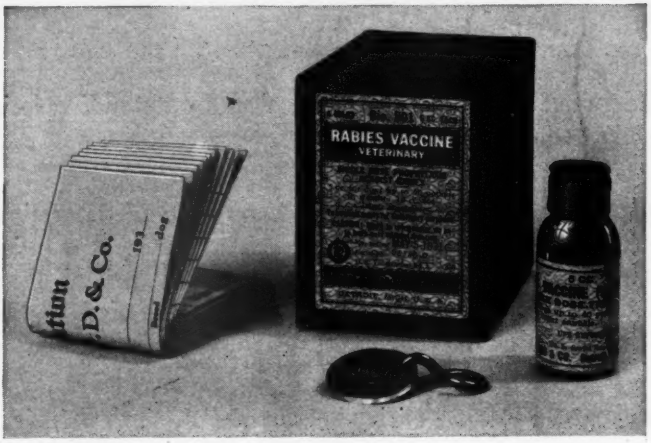


A PRODUCT prepared *only* from the brain tissue of dogs, thus guarding against the possibility of foreign protein reaction.

A *killed* virus vaccine assuring a high degree of immunity without any danger of producing rabies following its use.

The safety of P. D. & Co. Rabies Vaccine, Veterinary, is carefully checked on laboratory animals and its sterility determined by the tests of independent workers before it is placed on the market.

Rabies Vaccine, Veterinary, P. D. & Co., is supplied as follows:

	List price, subject to usual discount.
Bio. 800 in 5-cc. rubber diaphragm stoppered bottles at	**$ .65**
Bio. 801 in packages containing six 5-cc. bottles at . . .	**3.50**

A Certificate and Metal Tag are furnished with each bottle of vaccine.

PARKE, DAVIS & COMPANY

Detroit, Michigan ***Walkerville, Ontario***

PULMONARY EDEMA

Pulmonary edema is associated with a diphtheroid infection characterized by difficult breathing, cough, marked depression and if complicated with hemorrhagic septicemia there will be a rise of temperature.

Edema of the lung is the typical and outstanding lesion of pulmonary edema.

In herds affected with pulmonary edema, complications with hemorrhagic septicemia frequently occur. The microbes causing both conditions are combined in Mixed Bacterin Bovine (Kinsley). This product is recommended both as a preventive and curative agent.

Repeat orders for Mixed Bacterin Bovine (Kinsley) by practitioners throughout the country indicate that desired results are obtained. If you have not used Mixed Bacterin Bovine (Kinsley), give it a trial and be convinced.

50 cc (10 doses) Mixed Bacterin Bovine $1.25
100 cc (20 doses) Mixed Bacterin Bovine $2.50
250 cc (50 doses) Mixed Bacterin Bovine $6.25

Write, telegraph or telephone.

KINSLEY LABORATORIES

400-406 New Centre Bldg.,

KANSAS CITY - - MISSOURI

ARMY VETERINARY SERVICE

Regular Army

The promotion of 2nd Lieutenants Charles S. Greer and John L. Owens, to the grade of 1st lieutenant is announced.

Major Jesse D. Herrick is relieved from duty at Ft. D. A. Russell, Tex., and directed to proceed to San Francisco, Calif., and sail on the transport scheduled to leave that port on or about Feb. 4, 1931, for the Philippine Department.

Major Christian W. Greenlee is assigned to duty at Ft. D. A. Russell, Tex., effective upon completion of his present tour of foreign service in the Philippine Department.

The retirement of Lt. Colonel Herbert S. Williams for physical disability effective October 31, 1930, is announced.

1st Lt. Elmer W. Young is relieved from duty at Ft. Lewis, Wash., and directed to proceed to San Francisco, Calif., and sail on the transport scheduled to leave that port on or about Feb. 4, 1931, for the Philippine Department.

1st Lt. H. R. Leighton is assigned to duty at Ft. Lewis, Wash., effective upon completion of his present tour of foreign service in the Philippine Department.

1st Lt. L. R. Bower is relieved from duty at Ft. Sam Houston, Texas, and directed to proceed to San Francisco, Calif., and sail on the transport scheduled to leave that port on or about Feb. 4, 1931, for the Philippine Department.

1st Lt. Verne C. Hill is assigned to duty at Madison Barracks, N. Y., effective upon completion of his present tour of foreign service in the Philippine Department.

Colonel E. J. Cramer, upon his own application, has been ordered to proceed to his home on or about December 31, 1930, to await retirement.

Veterinary Reserve Corps

New acceptances:

Harden, James Henry, 1st Lt., 195 Berry St., Brooklyn, N. Y.

Howell, Leslie James, 1st Lt., Route 1, Kansas City, Kans.

Milman, Maurice Howard, 1st Lt., 1530 E. 33rd St., Brooklyn, N. Y.

Morgan, Donald Richard, 2nd Lt., 513 W. 23rd St., Vancouver, Wash.

Promotions:

Gillie, Peter Taylor, to Major, 2585 East Ave., Columbus, Ohio.

Williamson, Wallace LeRoy, to Major, 401 W. Winona St., Austin, Minn.

Lee, Chester Daniel, to Capt., Vet. Pathology, Iowa St. Col., Ames, Ia.

O'Flaherty, Fred, to Capt., Box 291A, RFD No. 12, Cincinnati, Ohio.

Vornheder, Albert Wm., to Capt., Sta. F, RFD No. 2, New Orleans, La.

Jeffers, Boyd, to 1st Lt., 206 E. 2nd St., Lexington, Ky.

GENERAL IRELAND REAPPOINTED SURGEON GENERAL

The reappointment of Major General Merritte W. Ireland as Surgeon General of the Army, effective upon the expiration of his third four-year term, October 31st, is an unusual tribute to him, constituting as it does, a departure from the generally observed policy which limits chiefs of army branches to a single term in such offices.

General Ireland has a long and illustrious record in the army. Appointed a 1st Lieutenant in 1891, he was first assigned to the 7th Cavalry at Fort Riley. During the years preceding the Spanish-American War, he served at Ft. Apache, Arizona, Ft. Stanton, N. Mex., Camp Wood, Calif. He took part in the Santiago campaign in July 1908 and was recommended for Brevet Major for galantry in action.

From that time until the entrance of the United States in the World War, he served at posts in many parts of the country, including two long terms in the Philippine Islands.

On May 5, 1917, he was promoted to Colonel and in September of the same year, became Assistant Chief Surgeon of the American Expiditionary Forces. In May 1918 he was promoted to Brigadier General and made Chief Surgeon of the Expeditionary Forces. In August 1918 he was promoted to Major General and appointed Surgeon General of the Expeditionary Forces, becoming Surgeon General of the Army in October 1918.

He was reappointed Surgeon General of the Army on October 22, 1922, and again in 1926.

His achievements for the improvement of the Medical Department during his long term as chief of that branch, have been many. His most notable achievements perhaps are the development of the highly efficient Field Service School at Carlisle, the establishment and expansion of the ideal Army Medical Center in Washington with Walter Reid Hospital and affiliated schools; and the inception and supervision of the publication of the mammoth History of the Medical Department in the World War; which comprises 15 large volumes of careful research, collection and compilation.

General Ireland will be retired for age on May 31, 1931.

BREEDER'S GAZETTE CHANGES OWNERSHIP

The announcement is made in the November issue of the Breeder's Gazette that the publication has been purchased by its editor, Samuel R. Guard.

"Sam" Guard was formerly instructor in livestock judging at the Chicago Veterinary College and is widely known to veterinarians, not alone graduates of the Chicago Veterinary College, but others who have attended the International Livestock Exposition.

If you are not taking the Breeder's Gazette, you should be. It is a large illustrated monthly magazine with a long history of achievement in the livestock industry, and costs but $1.00 for three years! The address is: Union Stock Yards, Chicago.

VETERINARY ACCOUNT BOOK

JOURNAL, DAY BOOK AND LEDGER ALL IN ONE AND OF A SIZE TO FIT YOUR POCKET

So simple that any one can understand it, and at the same time it meets every legal requirement and furnishes all necessary information. No ledger required. Each client's account complete on one page. No posting necessary.

Use may begin at any time with no loss of space, and book is good until filled.

Accounts may be kept in this book with the expenditure of less time and labor than by any other adequate system.

A complete record of every account is always with the doctor and instantly ready for presentation when an opportunity for collection arises.

A CHAPTER ON "FEES" furnishes the practitioner a valuable guide in making charges and in revising his scale of prices.

A CHAPTER ON "COLLECTIONS" gives in detail the principles of prompt collections and describes fully methods for collections that have proved successful.

Beautiful Flexible Binding

Price $1.50 Prepaid

Order from

VETERINARY MAGAZINE CORPORATION

4753 South Parkway, Chicago

The 37th Annual Meeting of the Missouri Valley Veterinary Association will be held in Kansas City November 19-21, 1930. On account of the American Royal Live Stock Exposition railroads will grant a rate of 1⅓ fare for the round trip from nearby states and 1½ fare from other points during the week of the meeting. The meeting will include a clinic at the stockyards.

The first meeting of the Science Association of the Ontario Veterinary College was held on Tuesday, October 21st, at Guelph, Ontario.

The Science Association is an institution founded for the purpose of discussing matters relative to veterinary science and is composed of members of the senior class.

Each member is required to prepare and present two papers on some subject related to veterinary science and such paper is open for discussion amongst the student body.

The following papers were read and defended at the first meeting:

1. Canine Distemper, by H. Alme.
2. Tonsillectomy in the Dog, by J. J. Bodendistel.
3. Oesophagostomiasis in Sheep, by V. R. Brown.

At the conclusion of these papers Doctor McGilvray, Honorary President of the Association addressed the meeting and gave some interesting information with regard to the use of the Laidlaw-Dunkin method of vaccination, as discussed at the recent International Veterinary Congress, London, England.—W. Stoneman, Secretary.

IN WASHINGTON

The SHOREHAM is the Capital's newest hotel. Surrounded by beautiful Rock Creek Park yet within 10 minutes of the White House. All outside rooms, 14 x 20 feet, each with bath, circulating ice water and radio. Facilities for recreation include tennis courts, riding stables, and glass-enclosed swimming pool.

RATES. $5 and $6 single
$8 and $9 double

The

SHOREHAM

Connecticut Avenue at Calvert Street
WASHINGTON, D C.
L. Gardner Moore, *Manager*

ARMY VETERINARY OFFICERS TO MEET

At the 1930 A. V. M. A. convention in Los Angeles there was a meeting of army veterinary officers both active and reserve to plan for a program and meeting of veterinary officers to be held in connection with the 1931 A. V. M. A. convention in Kansas City.

The following committees has been selected:

Lt. Col. N. S. Mayo, Res. Capt. J. A. McCallam, and Capt. Wm. G. Keehn, Res., to prepare a program that is now under way. Suggestions from veterinary officers or others will be appreciated and may be sent the chairman.

The next annual meeting of the Minnesota Veterinary Medical Society, will be held at the Lowry Hotel, St. Paul, on Thursday and Friday, January 15th and 16th, 1931. —C. P. Fitch, Secretary-Treasurer.

August Jasme, aged 67, died at his home in Savannah, Georgia, August 30th, following a heart attack.

Doctor Jasme had practised in Savannah for 41 years.

He is survived by a widow and a son, Dr. Henry A. Jasme of Jacksonville, Florida.

The number of veterinary officers in the Regular Army is barely sufficient for the needs of that force of 120,000. In any major national emergency, 2,800 additional veterinary officers will be required and must be obtained from veterinarians serving the civil population. If larger numbers of veterinarians do not join the officers Reserve Corps, in peace time, and acquire at least some training in the duties of a veterinary officer, the profession cannot make an advantageous showing in case of war. Reserve officers in other services and arms are constantly fitting themselves to serve in the military in case of a national emergency. If veterinarians do not follow this plan, it will be just too bad for the profession in case of war and after the war. This matter should receive the earnest attention of veterinary organizations and of leaders of the veterinary profession.

WHICH DO YOU PREFER?

We advise the use of unheated clear concentrated anti-hog cholera serum because it is obtained from healthy hyper-immune hogs.

In the production of unheated clear concentrated serum, all of the blood from the first, second, third and stick-out or final bleeding from each hog is centrifuged and kept in separate, properly identified containers until a Federal veterinarian has inspected and passed the carcass of the serum hog after the final bleeding. If the carcass of the serum hog evidences disease and is condemned, then all of the blood, that is, the first, second, third and final bleedings, is condemned.

In the preparation of heated clear concentrated serum, the first, second and third bleedings are not kept separate, and if the carcass of the serum hog shows disease and is condemned, the final bleeding is then rejected, but the blood of the first, second and third bleedings since it has already been mixed with the blood of other hogs, is not condemned and constitutes a part of the serum mix.

PEERLESS CLEAR, CONCENTRATED ANTI-HOG CHOLERA SERUM IS UNHEATED AND IS OBTAINED FROM HEALTHY HOGS.

PEERLESS SERUM COMPANY

Lyons and Water Streets

KANSAS CITY, KANSAS

WE PAY EXPRESS AND ORDERING CHARGES ON ALL SIZE ORDERS

The following advertisement will appear in the American Kennel Gazette and the American Field

Canine Distemper

Now Recognized as a Controllable Disease

THE PREVENTIVE TREATMENT of Distemper developed by Laidlaw and Dunkin with Vaccine and Virus, as prepared by the Lederle Laboratories, has stood the acid test.

Records show that thousands of dogs known to have been exposed to distemper following vaccination have failed to contract the disease.

An effective protection against distemper as proven by Laidlaw and Dunkin can be attained only if an active virus is injected following the administration of an initial dose of vaccine.

The Lederle Laboratories through exhaustive tests has proven that such active virus can be successfully distributed only in a dried form. All other attempts of keeping the virus effective failed.

The canine distemper products (Laidlaw-Dunkin Method) as prepared by the Lederle Laboratories are dependable for the preventive immunization of dogs as every lot of vaccine and virus is tested on ferrets before it is released from the laboratory.

Successful vaccination depends on efficient and tested products and the perfect health of the animals at the time of vaccination. Besides, the products must be properly administered and this applies especially to the injection of the virus which must be injected into the layers of the skin and not under the skin.

The Lederle Laboratories realizing the importance of this valuable preventive treatment and the skill required in its administration, has established a policy to limit its distribution through veterinarians only, as with their special training they are not only competent to administer the products correctly but also to exclude such dogs from immunization which are not in a proper condition.

By insisting on the use of Distemper Vaccine and Virus (Lederle) dog owners will effectively protect their animals against distemper, the most dreaded and most destructive disease of dogs.

The British Committee on Distemper stated that the canine distemper preventive treatment as developed by Laidlaw and Dunkin has satisfied the Committee of its effectiveness when properly prepared and tested. The Lederle Laboratories in cooperation with the British Scientists, has always followed in detail the procedures of preparation and testing originally developed by Laidlaw and Dunkin.

Write for booklet on the prevention of dog distemper.

LEDERLE LABORATORIES
INCORPORATED
511 FIFTH AVENUE, NEW YORK

THE AMERICAN RED CROSS

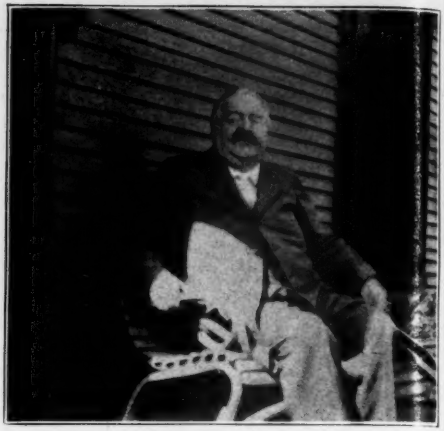
The greatest Roll Call that has ever been conducted, to enroll five million members in the American Red Cross in this country, was opened November 11, Armistice Day, and will continue until Thanksgiving Day.

During the year ending June 30, the Red Cross nationally expended $1,182,350.08 for service and disabled ex-service men and their families. The need for veteran relief is increasing, instead of decreasing, and the climax is still thought to be many years away.

The national organization handled 13,217 claims. Furthermore, $1,341,620.65 was needed to take care of 95,000 sufferers in 108 major disasters during the past year. More than $650,000 of this was in excess of contributions received for disaster relief.

Fifty-one thousand forty-seven Red Cross nurses were enrolled to meet national and international emergencies; 74,437 people were trained and certified in First Aid work, and 52,798 were certified in Life Saving. Besides this, 37,626 people were trained and certified in Home Hygiene and Care of the Sick. Nearly 7,000,000 school children were enrolled in the Junior Red Cross during the past year, as well.

The next regular annual meeting of the Oklahoma Veterinary Medical Association will be held January 19th and 20th, 1931, at the Skirvin Hotel, Oklahoma City, Okla.—C. H. Fauks, Secretary.



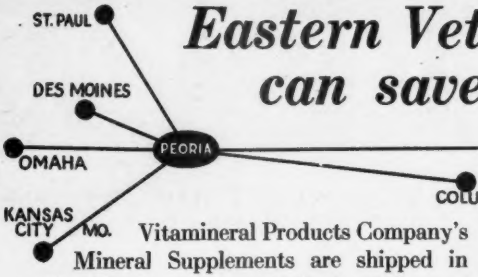
"Educator, Poet, Naturalist"—are names the Breeder's Gazette applies to Dr. A. S. Alexander in a biographical sketch in a recent issue. It might with equal truth have added Veterinarian, lecturer, philosopher, and without much stretch of the realities, humorist. The illustration shows Doctor Alexander seated on the back porch of his home in Madison, Wisconsin. Lake Monona comes right up to the steps leading to this porch, and from his comfortable chair the Doctor can watch the shimmering ripples, graceful sail boats and speeding motor boats in summer, and skating competitions, hockey and other ice sports in winter.

ONTARIO VETERINARIANS HOLD PROFITABLE MEETING

There was an unusually large attendance at a meeting of the Ontario Veterinary Medical Association held at Guelph, Ontario, recently. At a banquet held at the close of the meeting, the Hon. J. B. Fairbairn, Deputy Minister of Agriculture, Dr. J. D. Christy and Dr. C. G. McGilvray, Principal of the Ontario Veterinary College, addressed the meeting.

The clinic held at the Ontario Veterinary College included: Anti Pox Vaccination of Chickens, by J. S. Glover; Cryptorchid Operation in Bull Calf and Scrotal Hernia in Pigs, by G. S. Muir; Ovariectomy in Bitch, by Drs. McLellan, Cote and McIntosh; Cryptorchid Operation in Pig and Burdizzio Castration in Bull, by R. A. McIntosh; Pharyngeal Abscess in Dog and Corneal Opacity in Dog, by W. J. Rumney; Fistulous Withers in Horse, and Rumentomy in Cow, by D. R. Caley; Thrush and Canker in a Horse, by W. J. R. Fowler; Demonstration of Anesthesia with the Use of Sodium Amythol, by Drs. McDonald and McLellan.

Farmers who buy livestock feed are to have their own series of "read-the-label" radio talks, beginning in November. This new series comprising four talks is an extension of the Food and Drug Admistration's campaign to teach buyers of food and drugs how to read intelli-



Eastern Veterinarians can save money

Vitamineral Products Company's Mineral Supplements are shipped in carload lots to these centrally located warehouses. Eastern veterinarians are speedily served from Lancaster, Pa. and Columbus, Ohio. You pay freight from nearest point (not from Peoria) and save the difference. Our liberal discounts to qualified veterinarians mean a profitable addition to your professional fees. Write for literature. Send orders direct to

Vitamineral Products Company
1578 N. Adams St. :: Peoria, Ill.

VPC Products

1. VPC Mineral Compound Supplement for Swine
2. VPC Mineral Compound Supplement for Dairy Cattle
3. VPC Mineral Compound Supplement for Poultry
4. VPC Necro Compound Supplement
5. VPC Iodized Kamala Worm Compound
6. VPC Santonin Worm Capsules
7. VPC Swine Capsules
8. VPC Kamala Poultry Capsules for Tape Worms
9. VPC Round Worm Capsules (for Poultry)
10. Carbo Medicinalis Compound
11. Carbo Medicinalis Capsules
12. VPC Worm Oil
13. VPC Louse Powder
14. VPC Mange Medicine

gently the labels on those products. The administration through the Radio Service, is now broadcasting, from representative chains and stations of nation-wide importance, three separate "read-the-label" programs. The livestock-feed series comprises the fourth unit in this program. It will be broadcast by 83 representative radio stations.

NEW HOG FILM RELEASED

"How to Grow Hogs," a new 2-reel motion picture sponsored by the Bureau of Animal Industry and recently released by the U. S. Department of Agriculture, deals with economical methods of hog production. It shows the farmer how to grow hogs, and even the most experimental producer may learn from the film some points which he has overlooked or about which he has grown careless.

The picture illustrates approved practices in feeding, pasturing, farrowing, and weaning pigs and in the prevention of parasitic and other diseases. There are scenes of pictorial beauty, such as views of the Experimental Farm at Beltsville, Md., hogs feeding on alfalfa and clover, and a sow with her litter, appropriately captioned "contentment reigns supreme."

This film is of special interest to hog raisers and to farmers who may be considering this branch of stock raising. It may be borrowed from the Office of Motion Pictures, U. S. Department of Agriculture, Washington, D. C., and is free for transportation charges both ways.

FISTONE

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Successful Oral Treatment for Fistula

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Chronic Suppurations

Is Fistula treated successfully orally?

Before you decide on this important question, see what those who have tried it say. Booklet entitled "An Internal Treatment for Fistula and Allied Conditions" will be mailed you for the asking.

Clip coupon along this line and mail NOW!

THE FISTONE & APPLIANCE CO.,
College Corner, Ohio.

Gentlemen: Please mail me booklet on Internal Treatment of Fistula and Allied Conditions with FISTONE.

Trial Order—One doz. boxes (once only).....$ 8.00
Regular Price—One doz. boxes..... 10.00
½ doz. boxes..... 5.00

Check or money order inclosed with order. We prepay postage.

FOR THE PROTECTION OF AMERICA'S LIVE STOCK

THIS symbolic Crusader, adopted at the inception of our organization, in less than two years has come to mean to Veterinarians in all parts of the country, as it meant to us in the beginning—a Crusade for a better-appreciated and stronger Veterinary Profession, which is only another way of saying "For the Protection of America's Live Stock."

ALLIED LABORATORIES, *Inc.*

Operating

Pitman-Moore Company
Indianapolis

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Kansas City

Sioux City Serum Company
Sioux City, Iowa

Sioux Falls Serum Company
Sioux Falls, S. D.

United Serum Company
Wichita, Kas.

SANTONIN
Standard Anthelmintic

Santonin brings credit to the veterinary profession

Confidence in the usefulness of medicine in general can only be maintained by prescribing drugs of known value.

Amtorg Trading Corporation - - New York

John R. Mohler, Chief of the Bureau of Animal Industry, will make a fifteen minute radio talk Wednesday, December 24th, with "Veterinary Science" his subject.

The radio broadcast will be one of thirteen by internationally known scientists under the auspices of the National Research Council Science Advisory Committee to the 1933 Chicago World's Fair. Doctor Mohler's broadcast will be 7:15 P. M.

At the October meeting of the Kansas City Association of Veterinarians, a committee on local arrangements for the 1931 meeting of the American Veterinary Medical Association, which is to be held in Kansas City, was selected. A. T. Kinsley was elected chairman of the committee. It will have in charge all arrangements for the meeting, the procurement of a meeting place, the selection of an official hotel, the providing of entertainment features, etc.

The officers elected at the annual meeting of the Eastern Iowa Veterinary Association, at Cedar Rapids, October 7-8, 1930, are: F. M. Wilson, Mechanicsville, president; L. W. Kellogg, Anamosa, vice-president; P. V. Neuzil, Blairstown, secretary-treasurer; W. C. Vollstedt, Dixon, member board of trustees.

Mercurochrome 220 Soluble

(*Dibrom-oxymercuri-fluorescein*)

The treatment of wounds in animals imposes demands that are not to be disregarded if results are to be satisfactory.

The agent employed for disinfecting tissues must be active and of known dependability.

It must not interfere with tissue regeneration in any way.

It must not inflict pain, especially in small animal practice.

It must be inexpensive.

Mercurochrome-220 answers all of the essential requirements for satisfactory use in wound treatment of animals. Two to five per cent solutions are used in treating wounds.

Mercurochrome Powder, 10 grams—$1.50. 100 Grams—$13.25

Mercurochrome Tablets, 30-4.6 grains—$1.50. 100—$4.50.

HYNSON, WESTCOTT & DUNNING, BALTIMORE

DAIRMOL

Liquid Veterinary Antiseptic and Deodorant

Treatment of { Skin Diseases Cuts / Wounds Douching

You do not need to tolerate offensive odors on the hands after operations.

Use Dairmol as a lubricant in Obstetrical Operations. It is safe, healing and does not cause straining.

Price, $4.00 a Gal. F. O. B. Phila., Pa.

Research Department of

THE DAIRY LABORATORIES

2230 Locust Street Philadelphia, Pa.

KEN-NOL

Flea and Lice Powder

ODORLESS

Kills fleas, lice, mites and ticks with which it comes in contact on Dogs, Cats, Foxes, Chickens and Birds.

Guaranteed Efficient.
Contains No Pyrethrum.

KEN-NOL Flea Powder contains the ONLY powder which the U. S. Dept. of Agr. states actually KILLS fleas and pests. Other preparations only stupefy.

Two Oz. Sifter Can Retails at 50c.

Special Price to Veterinarians
One Dozen Cans $3.00
5-lb. Cans $3.50

KEN-NOL Powder is not poisonous in doses much larger than a pet would swallow in licking off the powder.

Castrate this New Way . . . .

USE GIANT EMASCULATOMES

Bloodless, Safe, Sure, Quick Sanitary Humane Castration.

Eliminates Dangerous Insanitary open incision method.

Proved Best, Easiest, Quickest way to Castrate.

Severs cord without open wound.

Easy to operate; no danger of Infection; Results Sure; no after care; minimum shock to the animal. No stunting; no schirrous cords.

MADE IN TWO SIZES

Little Giant for Use on Lambs.....Price, $ 9.50
Big Giant 16" Long for Larger Animals..... " 10.50
Prepaid with Instructions.

Big Giant, equipped with our NEW Twin Bearing Toggle Joints, "Pat. Applied For" Making a Stronger Instrument. Has rounded handles and is finished in Silver Aluminum, rust-resisting.

Send check, or will ship C. O. D. (Satisfaction guaranteed or money back.)

Haussmann & Dunn Mfg. Co., 565-567 Lake St., Chicago, Ill.

Last year a cooperative effort among the farmers of Webster County, Iowa, was undertaken for the eradication of the bot fly. All veterinarians in the county supported the campaign and furnished the parasiticide and administered it at 50c per dose. The results were so satisfactory that the work is being undertaken again this year, and Humboldt County also is following the same plan.

An entomologist from the Iowa State College at Ames recently made a survey to determine the efficiency of the treatment of horses for the knit fly larvae as reflected in the prevalence of the knit flies in the district. He reported that the number of these flies are distinctly fewer on farms where the horses were treated for bots last winter, than on farms where they were not treated.

He also reported that the farmers say that treated horses were in much better condition when the spring work started and that they were able to stand considerably more hard work than they were the year before when they were not treated.

It is the opinion of veterinarians taking part in the work that where the work is prearranged, this is usually done by the county agent, and all farmers on a given route have there horses ready for the treatment it can be administered for 50 cents per animal. Where this plan is not followed the minimum fee should be one dollar per animal.

THE VETERINARY RECORD
FOUNDED 1888

A weekly journal for the Profession.

PUBLISHED BY THE

NATIONAL VETERINARY MEDICAL ASSOCIATION
of Great Britain *and* Ireland

2 Verulam Bldgs., Grays Inn
LONDON W. C. 1.
ENGLAND

Subscription, $12.60 per annum.

DR. E. D. ANDERSON ENJOYS SPLENDID PRACTICE

Last month I told you about the success of Dr. A. B. Plummer of Kentucky as a Veterinary Practitioner and how well he has done with the handling of Hoosier Minerals as a side line. Following the meeting described last month Doctor Plummer ordered three 15-ton cars of Mineral Feed for immediate delivery.

This month I wish to tell you how one of the busiest Veterinarians in Indiana finds plenty of time to sell lots of mineral each year. Dr. E. D. Anderson is the Veterinarian to whom I refer, and is located in a small town in the north part of the State and travels more miles and has more calls than most of our practitioners. The Doctor gives a lot of time to the feeding of livestock and realizes that his clients must have a good mineral in order to produce livestock for the least dollar.

Doctor Anderson was very careful when he made his selection of mineral as he knew he must have one that was made with the proper ingredients and compiled by a man who knew how to make minerals palatable. Our mineral was selected and there isn't a place that Dr. Anderson goes but he is ready to properly recommend the right kind of rations for his livestock.

Every Veterinarian realizes fully that the proper balancing of feeds goes a long way toward the control of nutritional abortion. The world recognizes two kinds of abortion, nutritional and contagious. Nutritional Abortion is greatly benefited by the addition of our Yeastomineral to the diet. Of course, it is necessary to balance the feed and see that the proper carbohydrate and proteins are added. Every Veterinarian in our Organization can publicly testify that they never undertake to handle abortion regardless of whether it is nutritional or contagious, without first seeing that the animal is well mineralized with Hoosier Yeastomineral. The idea, of course, is to raise the vitality of the animal sufficiently for them to carry a normal healthy calf to maturity. Mineral *does not* cure or prevent infectious abortion, it merely assists nature in those selected cases in which the animal lacks and needs mineral.

If you want to know more about our Company and the merit of our goods, I can have many of our men write you direct as to just what you may expect of our goods.

Many Veterinarians have joined our sales force since the last issue of VETERINARY MEDICINE and others are coming in daily. Your clients are buying minerals from a layman and thousands of dollars are diverted to others that should come to you in the best interests of your clients and yourself. Let's stop this leak today and keep this money where it rightfully belongs. Write me direct today for further details.

HOOSIER MINERAL FEED COMPANY,
E. E. Clore, Veterinarian.
Greenwood, Ind.

[Advertisement]

The annual meeting of the Nebraska State Veterinary Medical Association will be held at the Lincoln Hotel in Lincoln, Nebraska, December 9th and 10th.—B. Witt, secretary-treasurer.

E. K. Glover, formerly of Kansas City, has located at Galesburg, Illinois, and established a laboratory for diagnostic work and the manufacture of bacterial products. In addition to a laboratory service, Doctor Glover will supply a consultation and clinical diagnostic service to veterinarians.

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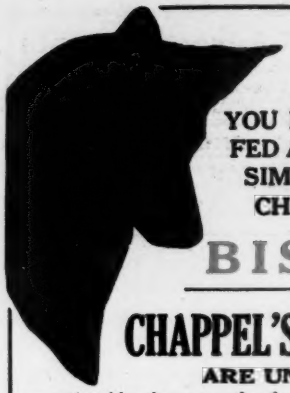

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